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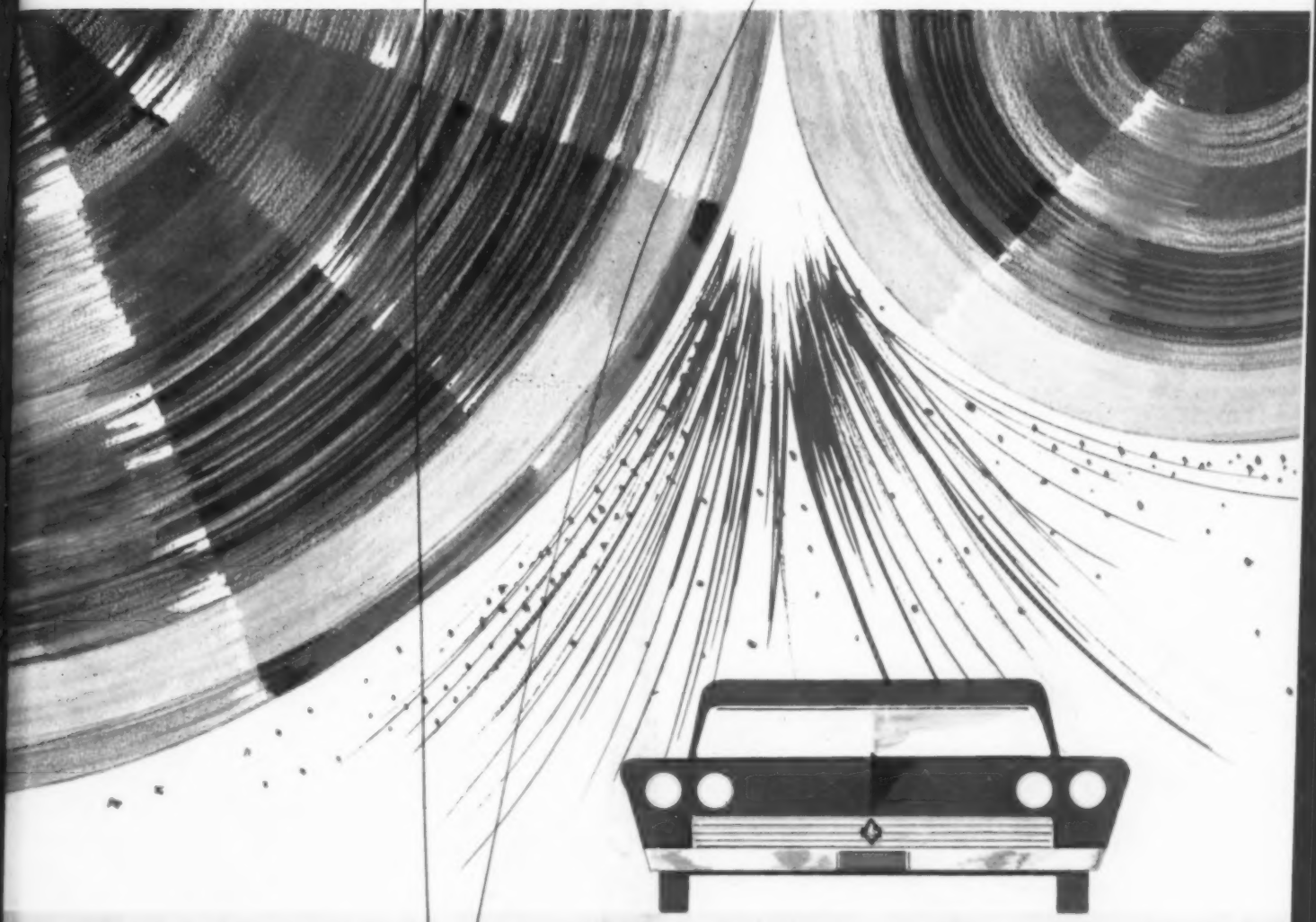
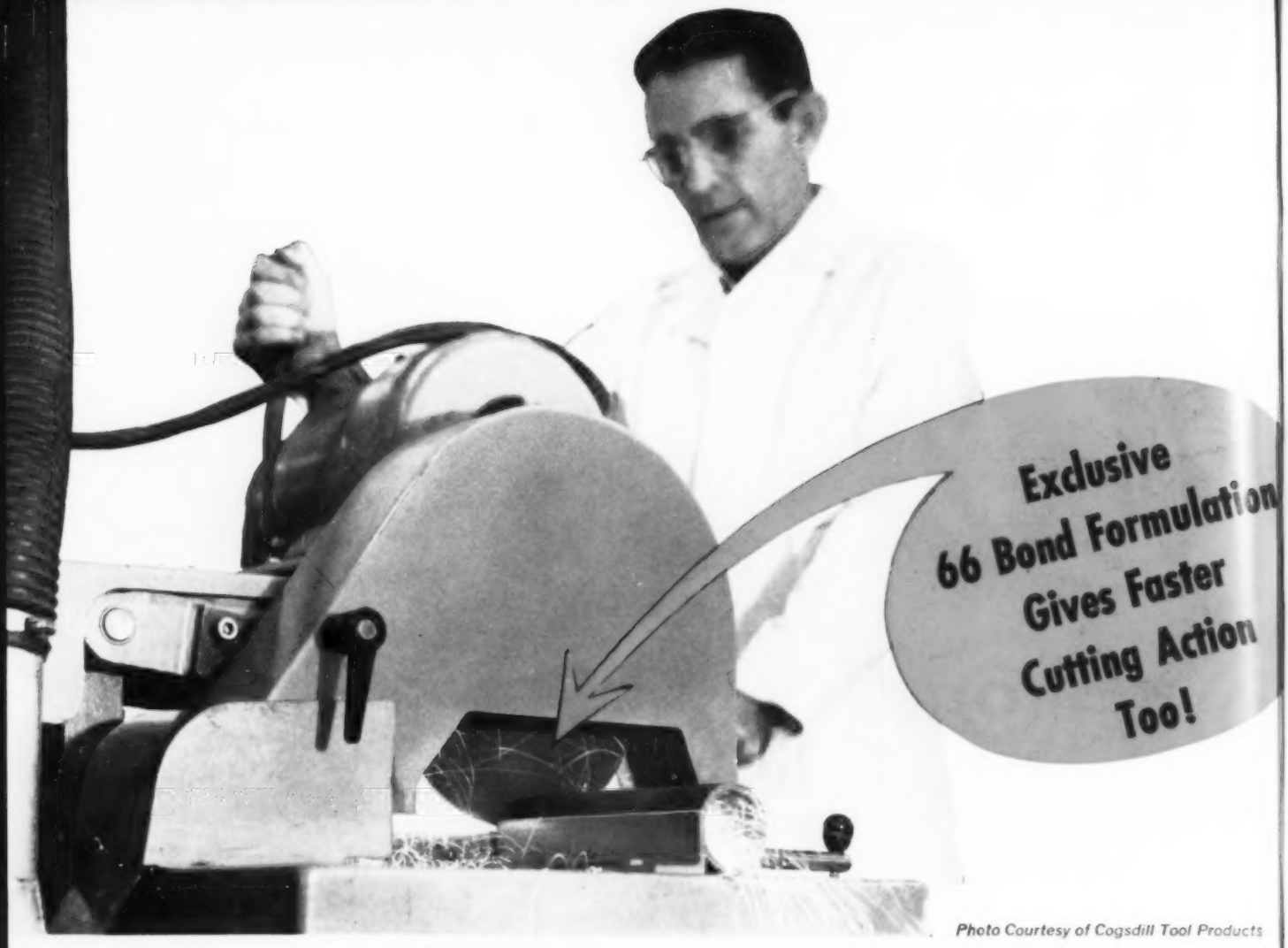


ABRASIVE MACHINING ON THE 62'S



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New Cutting-Off Wheel Lasts Longer---Minimizes Burn

Exhaustive field tests have now proven the superiority of Peninsular's 66 Bond wheels. Containing K-1017, a product of Peninsular research, the new wheel reduces burn when stock is large and pressure heavy yet keeps cutting when heat-sensitive material necessitates lighter pressure. The new bond is also more resistant to water vapor and coolant permitting it to be used where previously only rubber-bonded wheels were recommended.

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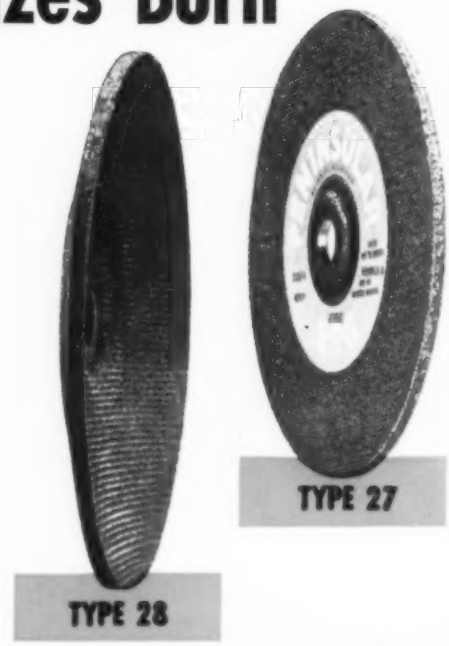
For all the information and specifications, write today for your free copy of Booklet 222-16.



In addition to straight wheels (type 1) Peninsular wheels are also available in raised hub (type 27) or saucer shaped (type 28) styles.

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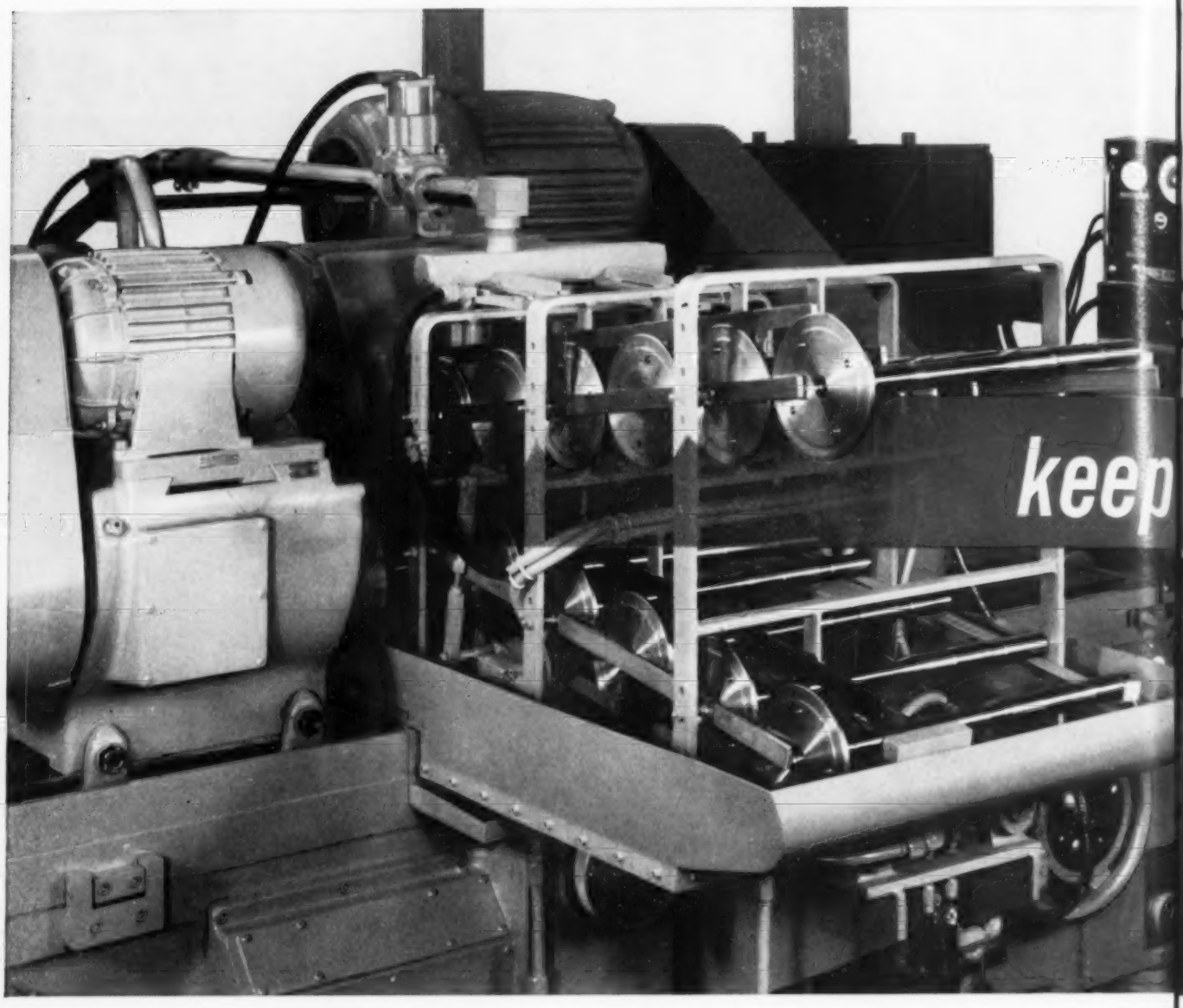
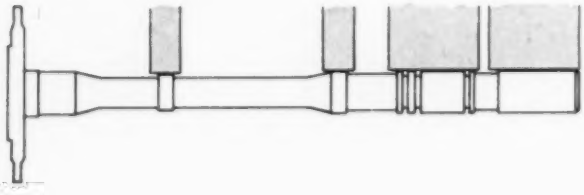
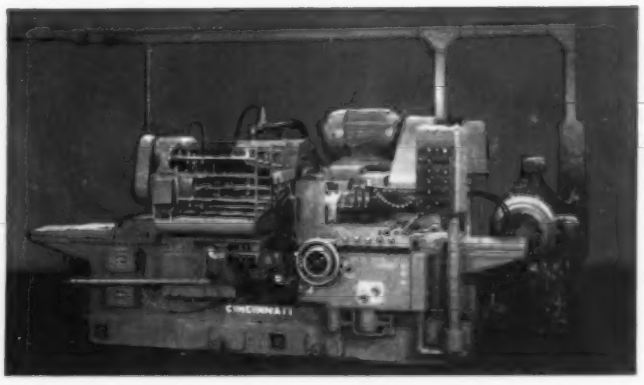


Widely spaced diameters are automatically ground on transmission output shafts. Drawing below indicates ground diameters. Cincinnati Cost-Cutting Specialists equipped a 10" x 36" Plain Hydraulic Grinder for this work. Production: 92 per 48 minute hour.



CINCINNATI FILMATIC



Completely equipped by Cincinnati Cost-Cutting Specialists for reliable, automatic production. The machine is a CINCINNATI FILMATIC 10" Plain Hydraulic Grinder. Information on standard machines in catalogs G-660-3 and G-661-2.

BUILDERS OF PRECISION GRINDING MACHINES: CENTERTYPE • CENTERLESS • RO

THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHI

Automatic Centertype Grinders built by

CINCINNATI | GRINDING MACHINE DIVISION

...the production line ROLLING!

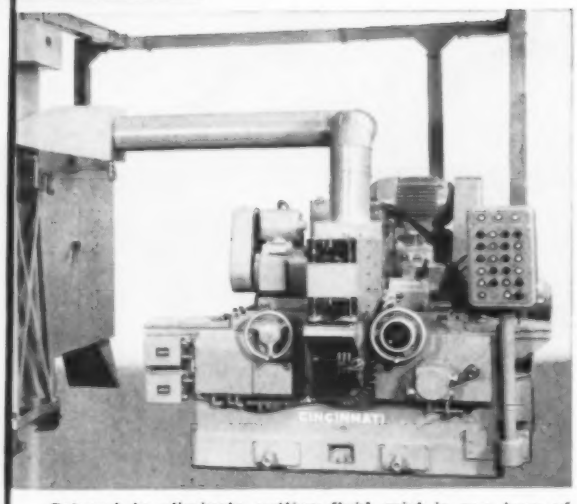
It takes considerable ingenuity to automate centertype grinding machines for continuous production duty. But it can be done quite effectively, as shown by the example illustrated here. The machine is a CINCINNATI FILMATIC 10" x 36" Plain Hydraulic Grinder, one of hundreds engineered and built for various operations by Cincinnati's Grinding Machine Division.

The machine automatically grinds several diameters on transmission output shafts, using multiple wheels having a 16" span.

Production feature-advantages engineered into this machine by Cincinnati Cost-Cutting Specialists include:

- Semi-automatic loading fixtures
- ACRASIZE Gaging System, with "jump on" probing unit
- Hydraulic automatic back rest
- Gap eliminator, to minimize the "grinding air" segment of the automatic infeed cycle
- Automatic wheel truing, including rapid traverse between wheels

FILMATIC grinding wheel spindle bearings and other standard feature-advantages contribute importantly to the extra reliable performance of Cincinnati cost-engineered Grinding Machines. Engineering service second to none; the industry's widest selection of precision grinding machines; our own ACRASIZE Gaging Systems; Cimcool cutting fluids and grinding wheels; these and 40 years' experience in precision grinding are your assurance of the most reliable cost-cutting equipment available anywhere. May we help in solving your manufacturing engineering problems in the areas of precision grinding?



Exhaust to eliminate cutting fluid mist is one type of equipment included with this CINCINNATI FILMATIC 6" x 18" Plain Hydraulic Grinding Machine equipped for automatic production.

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GRINDING MACHINE DIVISION

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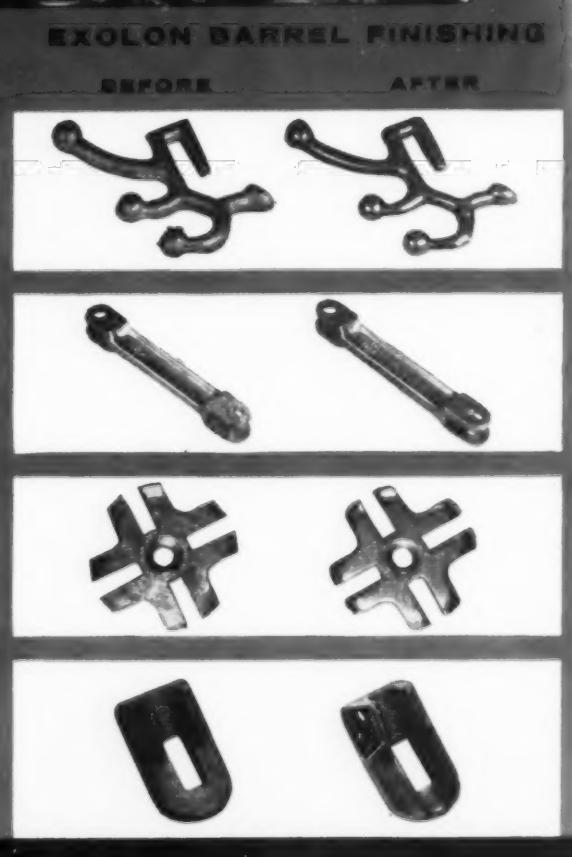

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- Centerless: High-Production OD Grinding—Part II
- Fillers—What Are They?
- Heat Coolants?

Grinding and Finishing

For Better Production and Finishing with Abrasives

VOLUME 7, NUMBER 11 NOVEMBER, 1961

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U. S. Patent 2,942,387

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The Performance Bond; proved best by the largest Aircraft and Automotive industries. Works excellently in either wet, mist or dry grinding. . . . and they are self-dressing.

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BUSINESS AND GOVERNMENT

The belief of some businessmen that government agencies are "necessarily incompetent and therefore the best we can do is oppose all government action," does not fit the realities of the modern world, according to a distinguished English specialist in management. Lyndall F. Urwick, of London, England delivered his opinion at a luncheon during the 9th Annual Joint Engineering Management Conference.

He said, "I do not count myself among those who are content to allow this problem to go by default. It is easy to be negative, to assume that government is necessarily incompetent and that, therefore, the best we can do is oppose all government action and to substitute competitive private enterprise wherever possible. But we live in a world which today has a population of some 2,500 million. By the end of this century, only 40 years away, that figure will be, at least, doubled. It may be trebled.

"This demographic explosion takes no account of political ideologies. It is, in fact, far more menacing than the physical, the nuclear explosions which currently preoccupy so many minds. Whereas today the prosperous, technologically advanced countries contain about ⅓ of the world population, in another 40 years they will account for only a quarter or maybe a fifth. And this at the very moment when the peoples of the underdeveloped countries are becoming politically conscious and insistent that they shall have a share in the material well-being which technological progress makes possible.

"Obviously, these facts raise issues far beyond the competence of any private organizations, indeed of any single national government. We can feed those extra mouths—we can prevent our passions and our politics from blowing our children's world to pieces. The technical and management problems involved are not insoluble. But they can be resolved on one condition and one condition only, that we recognize with all its implications the truth of Wendell Wilkie's historic phrase that we are indeed 'one world.' That means that disease and undernourishment and disorder anywhere are a cancer in the body politic everywhere. They must be eradicated, not for compassion of idealism, but as the barest common sense of human survival.

"That means inevitably government action, on a national and international scale. And, in spite of Professor Parkinson, I believe that it is possible to make official activity less bureaucratic and more effective. But that means putting **management into** government, and taking politics out of official action at the executive level."

After commenting on the importance of teamwork he concluded. "May we, the human team, go forward to defeat the problems which our immensely increased control over material circumstances has created. We have no other choice. But it will need superb teamwork if we are to act in time."

RIGHTS—OBLIGATIONS

I keep receiving technical data from behind the Iron Curtain with NO difficulties!

Antoni Niedzwiedski
Detroit, Michigan

So do I.

The point of the editorial, however was that in Russia such information must be shared, while in the United States companies are free to share or not to share—and that too many do not.

Fortunately, however, there are in this country many other companies which are far-sighted and big enough —in thinking though not always in dollar volume—so that a fair amount of worthwhile information is available for publication.

There is much, much more that ought to be generally known, and that could be published without infringing on information that is really vital.

This we will keep trying to bring to you.

F YOUR ABRASIVE BELTS LOOK LIKE THESE ... your production costs are too High!

If your used abrasive belts are wearing out prematurely due to one of these conditions, you are incurring extra expense in manhours, abrasive replacement and perhaps, even production volume. The Carborundum Company has made a detailed study of causes and solutions to loading, glazing and stripping of abrasive belts. Practical application of these findings to your grinding or finishing problem can result in increases in abrasive belt life from 10 percent to 500 percent. Typical problem solutions often involve only a change in the abrasive product, a different contact wheel or a changed coolant. Call your Carborundum distributor or factory representative today for an on-the-job analysis. Coated Abrasives Division, Niagara Falls, New York. **CARBORUNDUM**

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LOADING: Metal particles packed in between or completely covering the abrasive grains of the belt coating.

GLAZING: Face of belt smooth and glossy—indicates dulling of abrasive grain tips.

STRIPPING: Particles of the grain and bond pulled away exposing bare backing.

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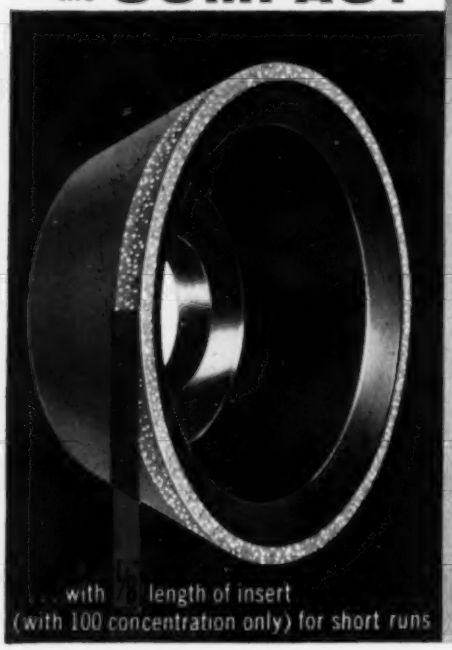
Announces an exclusive new concept for purchasing diamond wheels—

The EXACT-O-WHEEL

which lets you buy just the exact amount of grinding performance for any specific standard production job you have in mind. No more need to store expensive, partially used up diamond wheels on your shelves . . . now you can buy just the amount of diamond cutting you need for any job—short runs, medium runs or larger runs, tailor made to suit YOUR production.

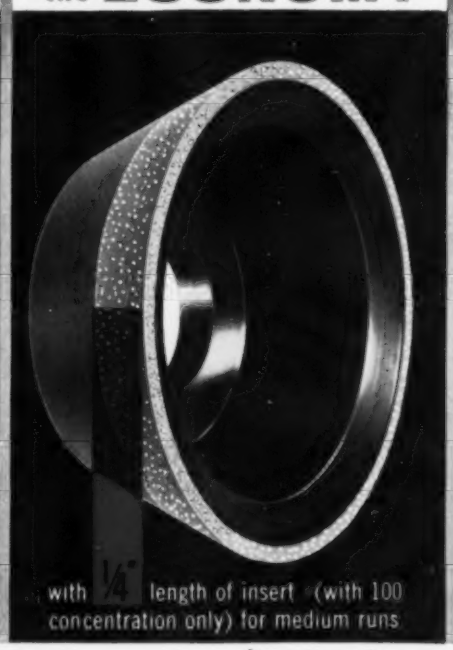
There are now 3 measures of diamond grinding available in the Flaring Cup Wheel (D11V9)

the COMPACT



. . . with 1/8" length of insert (with 100 concentration only) for short runs

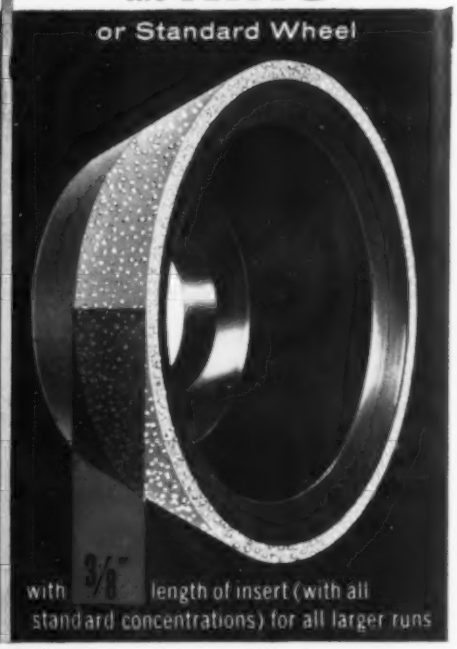
the ECONOMY



with 1/4" length of insert (with 100 concentration only) for medium runs

the KING

or Standard Wheel



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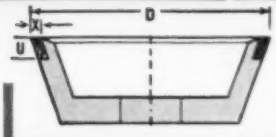
ALL EXACT-O-WHEELS are available in 1/16" and 1/8" depth of diamonds, in cup sizes of 3", 3-3/4", 4", 5" and 6".

There is an entire range of sizes . . . all available from stock, NOW . . . in plastic or aluminum backs, in natural and man made diamonds. You get all the qualities and grinding performance of the famous A.I.T. grinding wheel, yet you shave your costs with these versatile, exclusive wheels. See chart at right to choose just the wheel you need for YOUR next job, keep your diamond wheel dollars off the shelf . . . call, wire or write for Exact-O-Wheels NOW.



TYPE D11V9-FORMERLY D11B
Flaring Cup
Diamond in Periphery

Diameter (D)	Code (U)	Length of Insert (U)	Depth of Diamonds (X)	Diameter (D)	Code (U)	Length of Insert (U)	Depth of Diamonds (X)
3	Compact	1/8	1/16	4*	King	3/8	1/16
3	Compact	1/8	1/8	4*	King	3/8	1/8
3	Economy	1/4	1/16	5	Compact	1/8	1/16
3	Economy	1/4	1/8	5	*Compact	1/8	1/8
3	King	3/8	1/16	5	Economy	1/4	1/16
3	King	3/8	1/8	5	Economy	1/4	1/8
3-3/4	Compact	1/8	1/16	5	King	7/16	1/16
3-3/4	Compact	1/8	1/8	5	King	7/16	1/8
3-3/4	Economy	1/4	1/16	6*	King	9/16	1/16
3-3/4	Economy	1/4	1/8	6*	King	9/16	1/8
3-3/4	King	3/8	1/16	*Available in King size only			
3-3/4	King	3/8	1/8				

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Dateline: Industry's Economy

Poor quality abrasives are a serious handicap to the automation of Soviet production lines, according to a report in the USSR publication **Mechanization and Automation of Production.** An inspection of the warehouses of one of the largest producers of abrasives showed up 55% of the abrasive materials, 42% of the abrasive tools and 40% of the emery cloth as not up to technical specifications. Similar situations exist in at least two other large Soviet abrasive plants, according to the publication. Further automation is one of the goals of the current Seven-Year Plan, but it is apparently stalled until the quality of their abrasive output improves.

With exports on a plateau and imports rising, the balance of trade trends appears to be running against the United States. The trade surplus has been shrinking for nearly a year, shows no signs of changing direction. Improving conditions in the U. S. encourage imports, and level or worsening business abroad offers fewer opportunities for exports. Scattered reports of pick-up in foreign trade by U. S. companies have been encouraging, but have not yet reached significant volume.

Publicly reported cash dividend payments in the first eight months of 1961 totaled $8 billion, up 2% over the same period last year. August payments of $375 million matched August of 1960. Corporate profits in the second quarter were $45.5 billion, $5.5 billion over the first-quarter low.

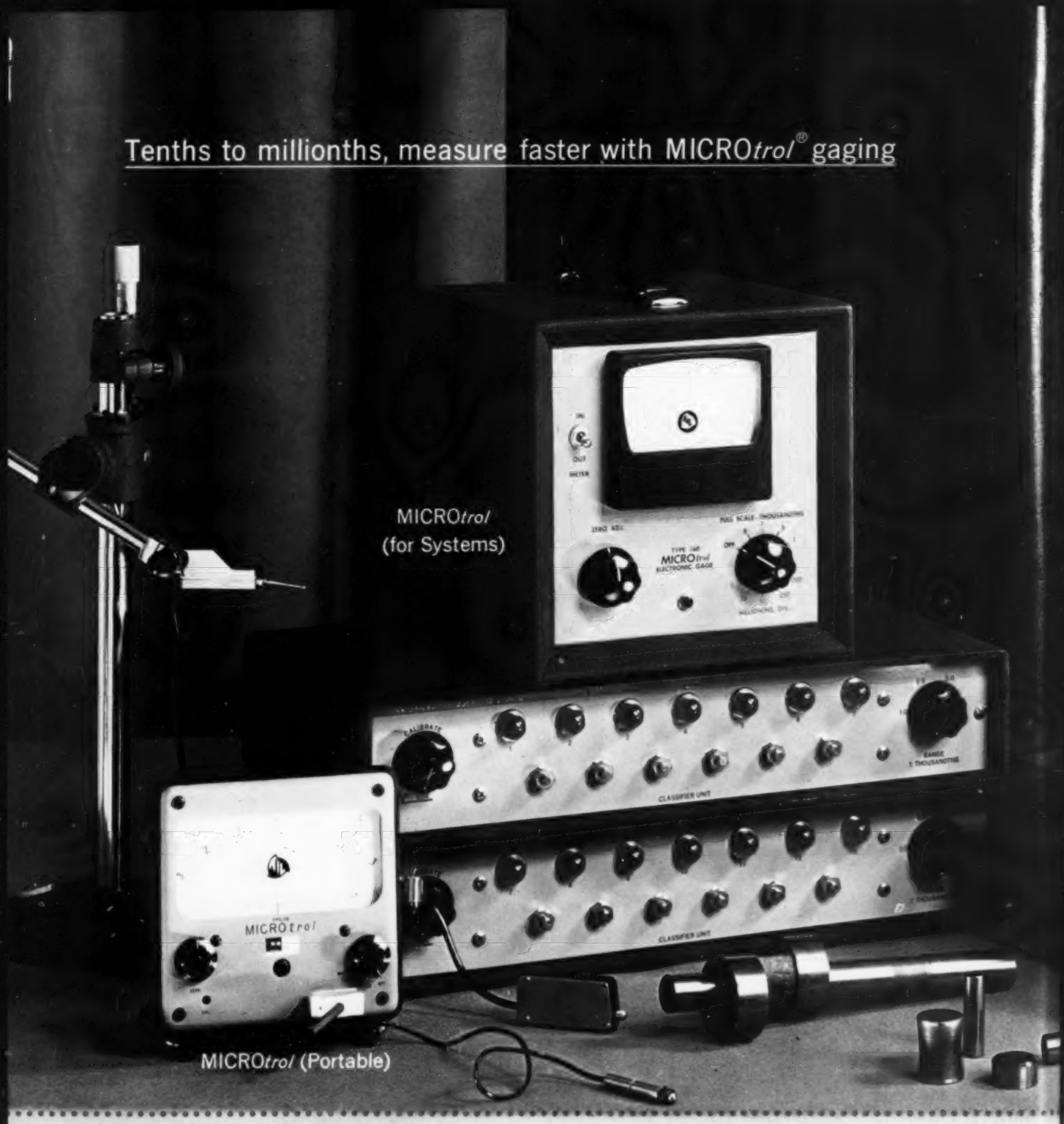
Abrasive machine shipments led all other categories of metal-cutting machines in both quantity and value in the first half of 1961, according to a recent Department of Commerce report. Over 25,000 abrasive machines with a value approximating $63.5 million, in either case over 40% of the metal-cutting total, were shipped during the period. The totals include grinding, lapping, polishing and buffing machines for gear tooth finishing and abrasive cut-off machines in addition to the usual grinding and polishing machine listing, but do not include any portable or home workshop tools.

Gross National Product for the third quarter reached an estimated annual rate of $525 billion, to exceed the record second quarter by about 2%. Much of the increase was in durable goods, which reached a level 15% above last February's low, while output of nondurables remained unchanged. New orders for durable goods in August hit their highest point since early 1959, and 19% above their low point of last January.

Governmental indebtedness (all units) was reported by the Department of Commerce as $356.3 billion in fiscal 1960. Expenditures (same units, same period) were $151.3 billion as against $145.7 billion in fiscal 1959. Taxes added up to $113.1 billion, $629 per capita, in 1960, were $99.6 billion in 1959.

Non-agricultural employment has picked up recently, but total employment remains at about 68.5 million, and the unemployment rate, seasonally adjusted stuck close to 6.9%. Encouraging note was a sharper than normal drop in long-term (15 weeks or more) unemployment to 1,400,000, of which roughly two-thirds have been out of work for six months or longer.

Tax matters tend to loom larger as the end of the year approaches. Automatic data processing equipment is being installed in the Atlanta district for scanning returns—business returns this year, and adding individual returns next. Present plans call for the extension of data processing to a new district each year, with the first run on company tax reports and full use in the second year of operation.



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Use this fast, accurate gage at the machine, in production, in inspection, in the laboratory.

It's rugged and lightweight because it's transistorized. Four interchangeable gage heads readily cover the whole range of normal gaging setups.

FEATURES: Weight only 3 lbs. Easy to operate; just 2 knobs. Two dual range models: ± .0003 to ± .003; or ± .001 to ± .010. Pocket sized. Accurate. Basic gages from $341.

Your first step to automatic quality control of machine tool production is MICRO*trol* Type 160

With this complete family of electronic equipment you can range from fast and accurate measurement of dimensions on the bench to complete control of manufacturing in the plant.

With accessories you can get automatic inspection, automatic sorting, or complete closed-loop control.

FEATURES: 4 scale ranges available. Repeatability to 0.000005". High stability and reliability. Comparator systems from $764.

Now with new motor drive Transistorized METRO*surf* Type 180 measures surface roughness at less cost

METRO*surf* is the low-cost, high accuracy way to end the hazards of measuring surface roughness by touch or sight.

It's fast. It's portable. You can use it at machine or bench. Battery or ac models available.

FEATURES: 5 range selections; 3 to 300 microinches full scale. Big dial. Motor-driven or hand-held tracer. Amplifier and tracer head, $495.

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AIL DIVISION

These Cutler-Hammer systems and gages hold metalworking to precise tolerances AUTOMATICALLY

To reduce inspection time and cost, Cutler-Hammer supplies the precision metalworking industry a range of gaging and control devices whose building block concept provides great versatility.

You can start with a MICRO*trol* gage or an INCHWORM motor. Then or later, you can add from a choice of accessories. These allow you to inspect, sort, reject, record quality . . . correct machine tools and stop them from making scrap . . . *completely automatically.*

These gages and systems are products of a company that's a leader in advanced military and space electronics, vastly experienced in control for industry. The science is there. The engineering is there. The reliability is there.

You'll be interested in the accuracy, the speed, the inspection and production savings. Contact a Cutler-Hammer sales office, check the publication inquiry number, or mail the coupon today for complete information. Gaging inquiries will be handled by gaging specialists.

Get more accurate production, fewer rejects with INCHWORM Type 202

Centerless grinders are freed from backlash, can maintain required tolerances in a way that will amaze you, when INCHWORM replaces the lead screw!

INCHWORM's ability to move either direction in microinch steps increases production as well as accuracy.

With automatic inspection and simple logic systems, INCHWORM will correct any off-dimension trends automatically. A virtual end to grinding scrap!

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AIL Division, Deer Park, L. I., New York

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Please check ☐ Send literature only ☐ Have a representative contact me

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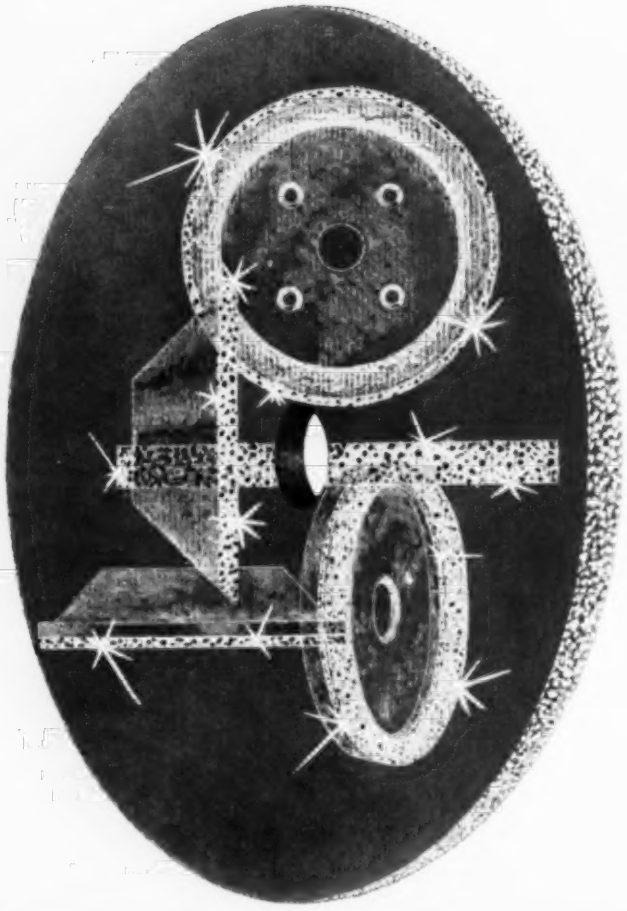
Three types of natural diamonds provide the broadest range of grinding requirements

There are 3 distinctive classifications of natural diamond abrasive, as defined below, which are based principally on differences of shape and strength of the diamond particle selected to meet specifications for resinoid and metal bonds. Each of these types evidences individual characteristics that demonstrate optimum grinding efficiency in certain specific applications. This extended range of characteristics is an exclusive feature of natural diamond that is contributing effectively to wheel performance by meeting the precise requirements of various job conditions.

In modern development and design of peripheral and flaring cup wheels, the choice of natural diamond type is considered equally with other elements such as grit size, rate of feed, surface and table speeds, to maximize efficiency in given applications. Knowledge of the effect of correct diamond type selection on grinding efficiency is another result of Engelhard Hanovia research in diamond technology. ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★



SND-RB (Selected Natural Diamond for Resinoid-Bond Wheels) is the result of advanced methods of scientific shape selection, whereby only needle and sliver shaped particles are selected for maximum grinding efficiency at lowest possible cost. SND-RB is greatly superior in the majority of applications requiring resin bond wheels. It is available in Treated and Untreated form for specific job applications. SND-RB Treated is subjected to a heat treating process which results in the formation of a film of graphic carbon on the diamond surface. Because graphite is considerably more reactive chemically than diamond, and more easily wet, it is indicated that the surface film greatly improves adhesion between the resin bond and the diamond. Under certain shop-use conditions, however, SND-RB Untreated has been found to be the optimum grit for maximum grinding efficiency.

SND-MB (Selected Natural Diamond for Metal-Bond Wheels) is carefully selected blocky-shaped diamond material. The internal structural strength and blocky shape of this natural diamond make it extremely resistant to breakage. This quality is being utilized to excellent advantage in metal bond wheels.

CONVENTIONAL NATURAL DIAMOND possesses the excellent abrasive efficiency of all mined diamonds. It contains a variety of shapes which provide special advantages in certain grinding applications.

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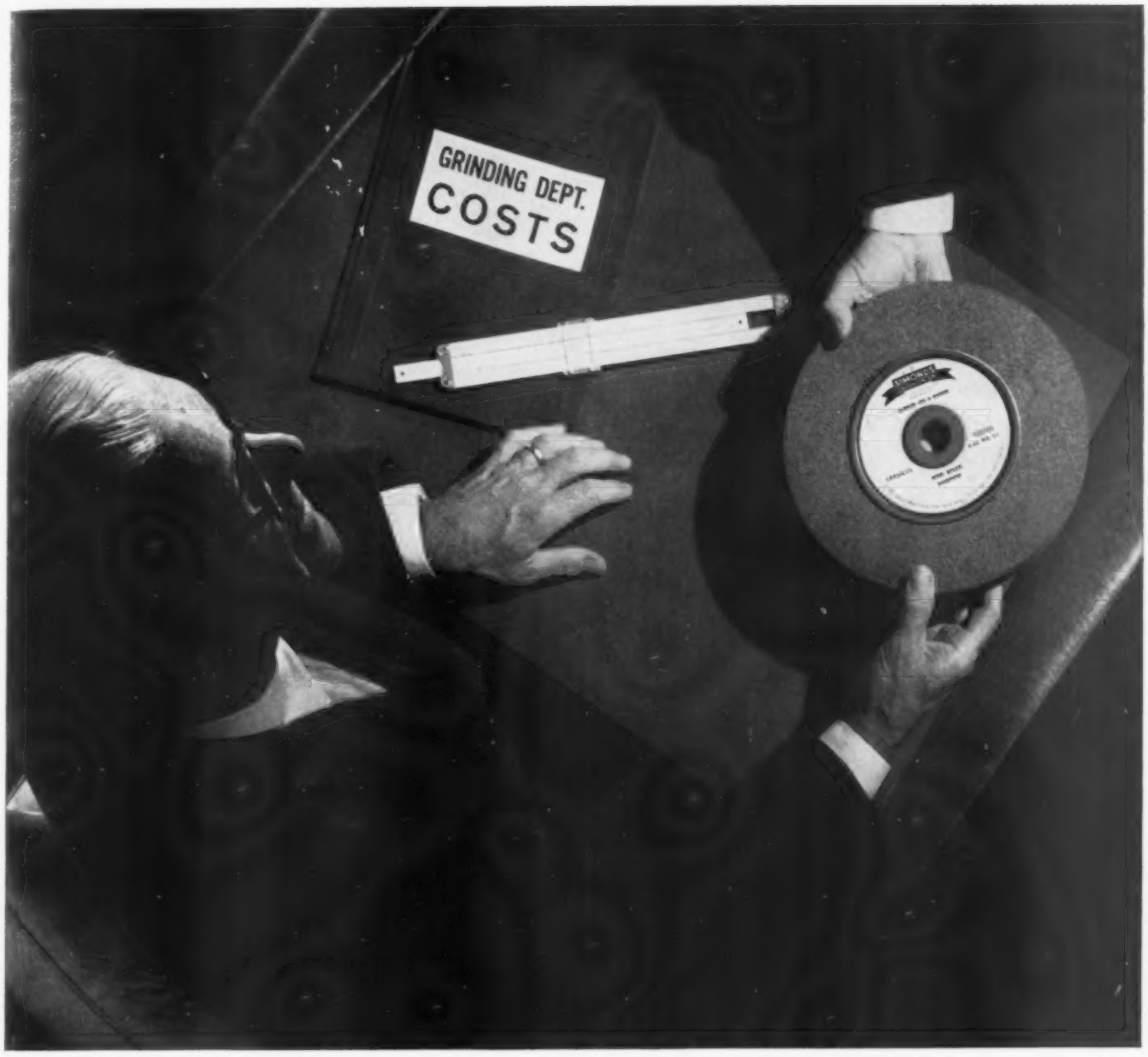

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Wheel life to wheel output! With that ratio right, you save machine and operator time . . . cut rejects. And that's where Simonds can help you. How? With grinding wheels that head into the work with a bite that keeps biting . . . wheels with speed and stamina to make fast, efficient work of the toughest, hardest metals . . . wheels that save set-up time by often eliminating the need for wheel change when switching operations . . . wheels your Simonds distributor can supply in specifications that give you that essential, cost-cutting ratio between performance and production. Send for illustrated catalog now.

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Operator puts finishing touches on carbide reamer using Bay State Diamond Wheel (specially formulated to hold its shape and require minimum number of dressing operations).

BAY STATE TEAMWORK PAYS OFF AGAIN

with a new diamond wheel for SEVERANCE TOOL

When you use a substantial number of diamond wheels every month, it pays to keep a steely eye on costs. That's why a man like Purchasing Agent Millard Wells of the Severance Tool Industries, Saginaw, Michigan, insists on continuous testing for every cost factor in the book.

The specific problem was to develop an improved diamond wheel for close-tolerance grinding of Severance Carbide Reamers and at the same time to reduce time-consuming, material-wasting dressing operations.

Figuring out the details of the new wheel was a team operation right from the beginning. Bay State's Sales Engineering Staff and the Quality Control people in Westboro worked very closely with Jack Sullivan, of distributor Saginaw Supply Corporation and with Severance's Purchasing Agent Millard Wells.

Result: A specification that increased cutting speed and wheel life with substantially reduced dressing requirements ... and a beautiful demonstration of the benefits that accrue when two companies get together that both insist on quality right down the line.

Your Bay State distributor or direct representative can show you one of the most efficient lines of diamond wheels in the world manufactured with either man-made or natural diamonds . . . as well as offer you the services of a group of specialists whose knowledge of hard-materials grinding techniques is unparalleled. *Better grinding at lower cost . . . that is our business.*

Severance Purchasing Agent Millard Wells (left) and Bay State Distributor's representative Jack Sullivan (of Saginaw Supply Corp., Saginaw, Michigan) examine typical carbide tools which require diamond grinding.

BAY STATE WHEELS of PROGRESS

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HERE IS THE NEW CHAMP

The old Aro 7025 Vertical Sander was industry's favorite for years. Nothing could touch it for speed, power, reliability.

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The new champ is the ALL-NEW ARO 7025 Vertical Sander. A completely re-designed job that brings you new Aro engineering advancements, new Aro concepts in lightweight, compact design.

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- **EASIER HANDLING**
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This well-known manufacturer depends on . . .

A BANK OF THOMPSON GRINDERS

. . . for a tough production job.

THOMPSON RAMO WOOLDRIDGE INC. picks Thompson Grinders for accuracy, dependability and speed.

All the Thompson machines shown above in one bank are grinding jet aircraft engine compressor vanes. Each of the 5 surfaces on the root end as well as the concave and convex airfoil surfaces on the lug end are ground to extreme accuracy on the stainless steel forgings.

For the five years that these Thompson machines have been steadily on this job, downtime and maintenance costs have been negligible factors.

Put your toughest production job on a Thompson grinder and watch it cut your costs, speed your production and improve your product.

THE THOMPSON GRINDER CO. Springfield, Ohio

"Keep Thompson in mind for that daily grind"

Thompson SURFACE GRINDERS

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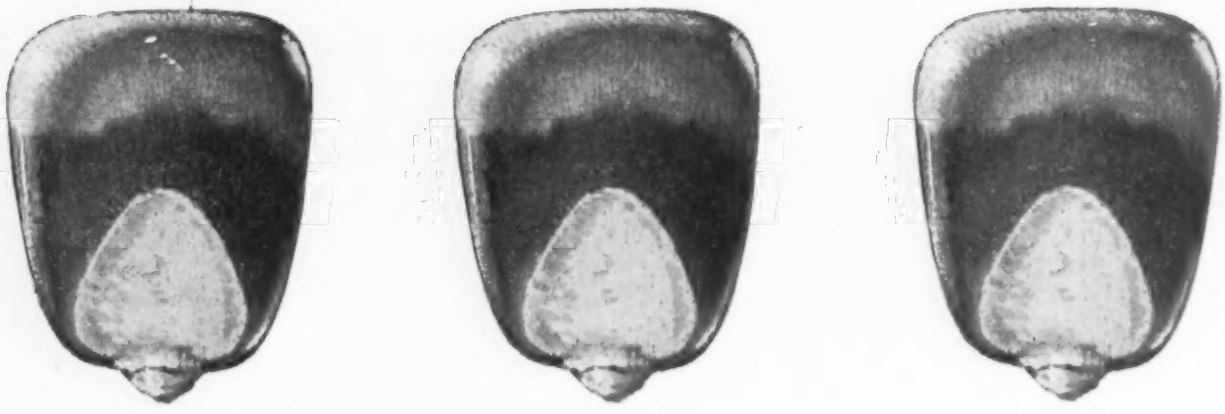

POSITIVE DUPLICATION—EVERY TIME!

Each one of these kernels of corn has positive duplication built into it, just as have these internal wheels, and *all* CINCINNATI Ⓟ° GRINDING WHEELS. There are good reasons for this Ⓟ dependability . . . 36 good reasons.

FAMOUS, UNIQUE PROCESS

Three dozen unvarying quality controls govern every step of the famous Cincinnati Ⓟ manufacturing process, unique in the industry.

For example, the atmosphere of the mold room is *climate controlled* with conditions of temperature and humidity that *remain the same* from hour to hour, from day to day, from year to year!

RESULT: UNSURPASSED UNIFORMITY

This extraordinary attention to manufacturing detail results in wheels of unsurpassed uniformity. You can reorder CINCINNATI WHEELS with confidence, because they give you the same good job time after time. You use fewer wheels because Ⓟ wheels last longer.

CALL CINCINNATI TODAY

Factory trained by the Cincinnati Milling Machine Company, our grinding specialists are available to you for consultation on all your grinding problems. Call your CINCINNATI GRINDING WHEELS Distributor, or contact us direct, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

PD POSITIVE DUPLICATION

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GRINDING WHEELS

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Metalworking on the move

With an expected increase in U. S. production in the last half of this year, world steel production in 1961 should exceed the record 360 million tons of 1960. World production in the first six months, exclusive of the United States, was 7% ahead of the same period in 1960. For the U. S., production was down 26%. With the third quarter marked by shutdowns in automakers' plants as labor and management continue to bargain, the immediate outlook has not been good. High-gear automobile production for the last quarter appears to be a requisite to beat the 1960 level.

Canada presents profit opportunities in metalworking, according to a recent Ontario Department of Commerce survey, results of which were recently published. Over 150 specific instances are cited. Tie-ups with Canadian firms on a joint venture or royalty basis, the growing variety of Canadian-made products coming into the U. S., and possibilities of manufacturing in Canada some products now being imported.

No steel price increases, and even a couple of scattered decreases, were the immediate result of the steel wage increases that became effective October 1. Grumbling there was. Arthur B. Homer, Bethlehem's chairman, in dedicating a new research center, expressed a wish for as much governmental concern over profits as over prices. He pointed out that funds to build the center had come from post-World War II profits.

Only confusion among steel fabricators appears to be as to whether to make one price rise or two—and how to do one or the other in the face of stiff competition. Their executives pretty much agree on the need for higher prices, whether or not basic steel costs more, but there the accord ends. Many of these companies also bargain with the United Steelworkers, also had a wage increase on October 1.

A pocket-sized super-magnet weighing about a pound, recently announced by Westinghouse, will lift as much as a 20-ton conventional magnet, using power from an automobile battery. A niobium-zirconium alloy wire kept at a temperature of minus 450° F is the heart of the magnet. At that temperature, the alloy loses all resistance to electricity, and the only power needed is to supply energy lost in the wires leading to and from the magnet. For a comparable conventional magnet, with half the lifting power, the hourly power requirement would be equal to that used in a normal household in two weeks.

Low customer inventories and hand-to-mouth buying with short lead times and rush delivery characterize current business for steel foundries, as about three-fourths of members responding to a Steel Founders Society of America questionnaire predict increased shipments in the second half of 1961. Over-all, the year should equal, and appears likely to exceed 1960.

Battery-powered portable tools are now a reality, as Skil Corporation introduces an auto polisher, shears, a hedge trimmer and similar tools. Fully-portable power is provided by a battery clipped to the user's belt. Price-wise, the cost of battery and charger probably equals the price of the tool. One quotation was $59.95 for the hedge trimmer; $50 for battery; $15 for the charger.

HOW TO REACH GREATER DISC GRINDING QUALITY

...take the BESLY 3G ROUTE

Unity is a basic reason for grinding superiority on the Besly 3G Route. *All* your disc grinding problems and requirements are studied by one experienced source, Besly. *All* are met—no matter how stringent or diverse—by the same source. And it's all available through one man, your Besly grinding specialist—your Besly G². Here's how he makes it work:

G¹ Abrasive performance is studied on the job. Quality, abrasive cutting action and efficiency are watched, closely. Besly abrasive recommendations that result are right because they are designed for the job.

G² You use the broad knowledge and experience of your Besly grinding specialist to the best advantage . . . to make your grinding processes a more profitable art.

G³ Your grinding requirements determine the Besly disc grinder we recommend. The grinder that does the job faster . . . better! The one that returns more for every tool dollar you invest.

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ASK YOUR BESLY G² FOR AN ABRASIVES PERFORMANCE TEST—1—Tell him the material to be ground. 2—Tell him the amount of stock that must be removed. 3—Tell him the finish required. 4—Tell him the area in contact with the abrasive. 5—Tell him the spindle speed. He'll do the rest.

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Centering Interest on the "Touch of Gold"

Centerless grinding is a *two-wheel* operation but your best team is the *one-brand* combination of a Norton 23 ALUNDUM* grinding wheel and an R51 bond feed wheel.

On the Norton No. 2 Straddle-Bearing Centerless illustrated, or on any other centerless grinder, both wheels are premium performers at a non-premium price. The new 23 ALUNDUM abrasive is no ordinary aluminum oxide but exceptionally fast and free cutting. The R51 rubber bond feed wheel is outstanding for long-lasting, positive work support, without slip or chatter.

Find out how this "Touch of Gold" team can bring new precision and economy to your own centerless grinding. Your Norton Man, an abrasive specialist, or your Norton Distributor are always ready to help. NORTON COMPANY, General Offices, Worcester 6, Massachusetts.

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Suddenly complex finishing has a simple solution!

The Pangborn Vibratory Finishing Machine has an unusually wide range of applications. What would you like to descale, deburr, radius, finish or burnish?

Metal and metal alloy as well as many plastic and ceramic parts may be vibratory finished. This machine processes extremely small and delicate items with the same facility it handles large and heavy objects.

What's more, the Pangborn Vibratory Finishing Machine performs as much as 100 times faster than conventional equipment. Cuts costs? You bet!

All sizes of the machine come equipped with variable speeds and amplitudes plus new improved air-cushioned suspension. Optional air-cushioned floor mounts completely eliminate any transmission of vibration to the floor. Auxiliary equipment and the best in media and compounds are available for your every need. Send parts with exact finish specifications or finished specimen for sample processing in our laboratory to Mr. William E. Brandt at:

PANGBORN CORPORATION, 820 Pangborn Blvd., Hagerstown, Md.; Pangborn Canada Ltd., 47 Shaft Rd., Toronto (Rexdale), Canada; —*Manufacturers of Vibratory Finishing, Blast Cleaning, Dust Control Equipment—Rotoblast® Steel Shot and Grit®.*

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No. 26 • GRINDING and FINISHING • 1961

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Elgin Diamond Wheels assure precision grinding for the exotic metals and ceramics used in today's miracle products for military and civilian needs. They all call for recognized Elgin quality – Elgin know-how – Elgin long life and economy. Elgin can study your job and engineer wheels for the most exacting requirements. Whatever the need, there's just one name to remember . . . ELGIN!
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Book Reviews

INTRODUCTION TO FOUNDRY TECHNOLOGY

(By D. C. Ekey and W. P. Winter, 296 pages, $7.00)

This book is an advanced version of a foundry-course manual which was developed and used by the authors at The Pennsylvania State University.

The text material is intended to introduce the engineer and the engineering student to the basic concepts of foundry technology. The work is presented in an abbreviated outline form that permits a comprehensive coverage of the subject matter in a minimum of time and avoids embellishment with figurative language.

It is divided into two sections. The first comprises a series of lectures on the theoretical aspects of foundry technology. These lectures provide a functional perspective for the engineer whose profession requires correct decisions relative to the limitations and applications of the casting processes. The second section provides operational information in the methodology of numerous foundry procedures and processes. These practicum lessons are roughly integrated with the lecture series. The development of craft skills is not a major objective, but the comprehensive treatment of job operations is intended to provide the engineering student with a more mature and realistic understanding of the casting processes.

The Book Shelf, Dept. GF-11, Hitchcock Publishing Co., Wheaton, Ill.

RARE METALS HANDBOOK

(Edited by Clifford A. Hampel, 715 pages. $20.00)

A revised, expanded, and up-to-date volume on rare metals that provides engineering information on many important structural materials. Compiled by 44 experts, this handbook presents the full range of currently available data on 55 of the less-common metals.

The book presents recently declassified material on plutonium and the rare earth metals, along with discussions of cesium, chromium, rubidium, scandium and yttrium, as well as columbium and tantalum. Properties and comparisons between metals are shown in convenient tabular form wherever possible, and complete reference lists close every chapter.

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Barrel finishing is best finishing

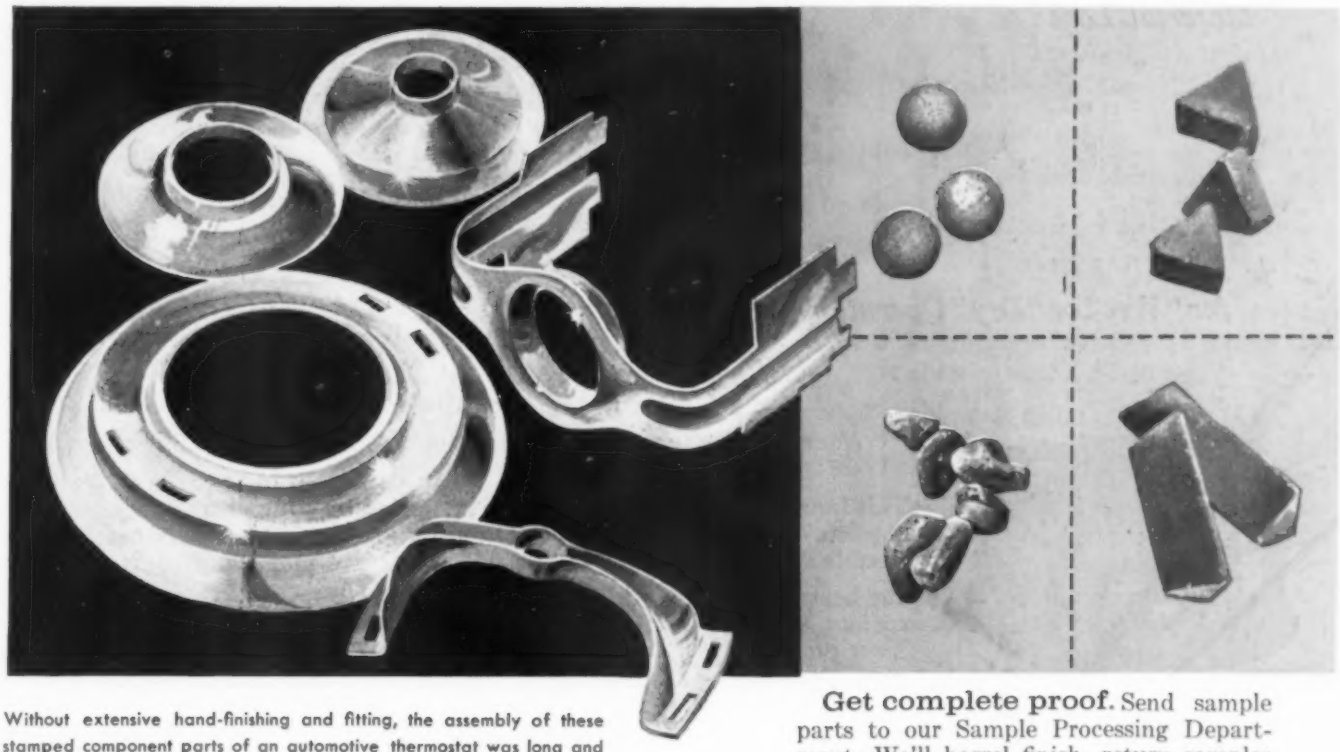
. . . to cut your assembling costs

Assembling finished parts is no longer the money-wasting problem it used to be.

Barrel finishing with Norton TUMBLEX abrasives is your modern solution . . . your surest, quickest way to remove burrs, heat scale, sharp or rough edges and other surface imperfections that keep complicated parts from fitting together smoothly and accurately.

We say *your* solution because the scope of TUMBLEX abrasives is virtually unlimited. The parts you finish . . . for assembling or for any other purpose . . . can be of any metal, ferrous or non-ferrous . . . or non-metallic including plastics and even woods . . . as hard as sintered oxides or soft as the softest machinable material . . . and their sizes can range from miniature to massive.

Barrel finishing with the right TUMBLEX abrasive not only improves your product appearance and quality — its speed and simplicity can increase your man-hour productivity and cut your cost-per-piece produced.



Without extensive hand-finishing and fitting, the assembly of these stamped component parts of an automotive thermostat was long and difficult. Barrel finishing with Norton TUMBLEX* abrasive proved unequalled for removing burrs that brought new speed to assembling.

Get complete proof. Send sample parts to our Sample Processing Department. We'll barrel finish, return samples and report the methods and abrasives you need for new production advantages. NORTON COMPANY, General Offices, Worcester 6, Massachusetts. Plants and distributors around the world.

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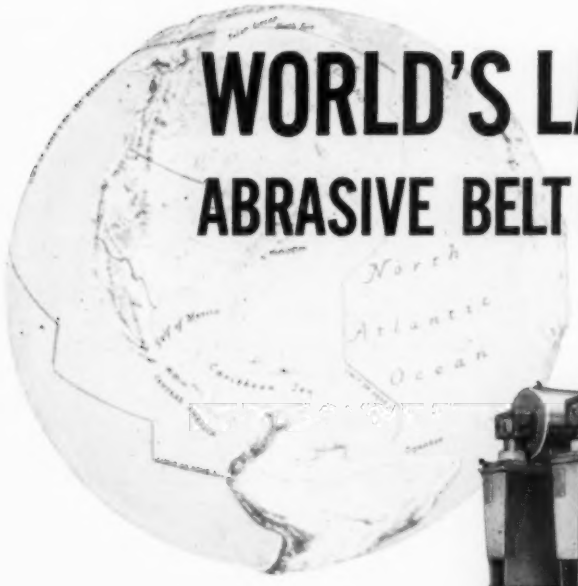
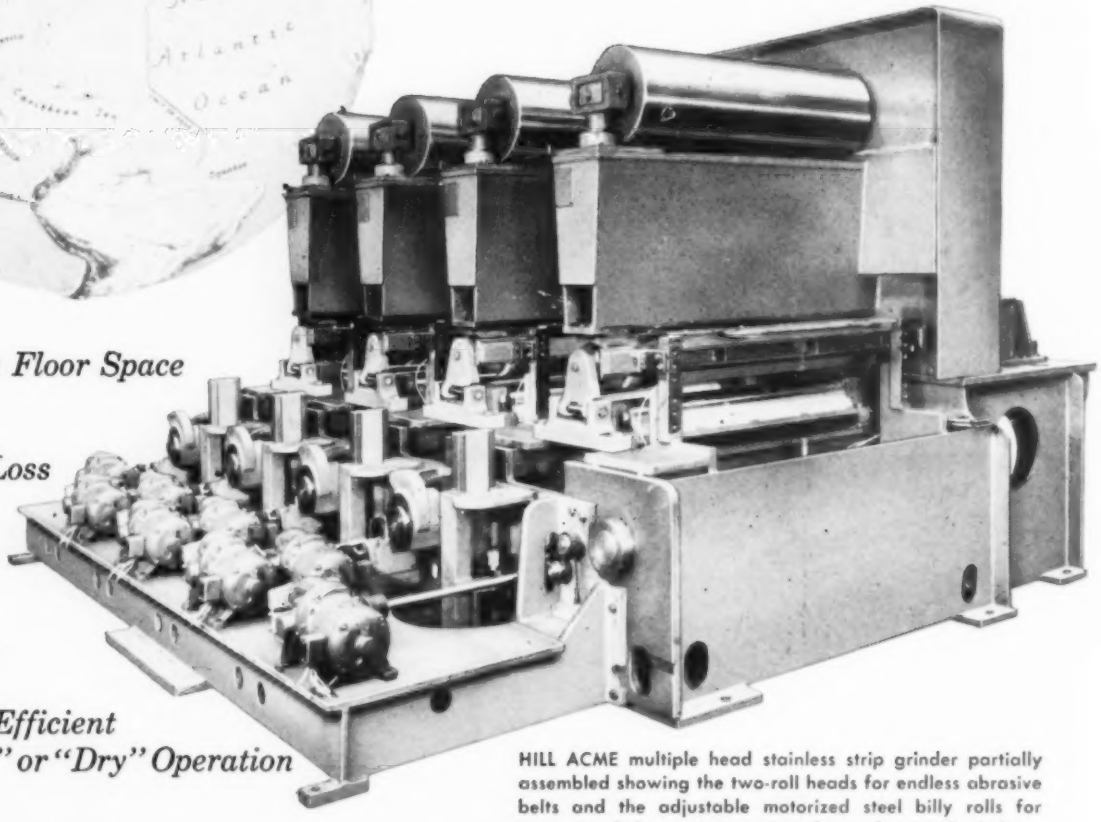
WORLD'S LARGEST MULTIPLE HEAD ABRASIVE BELT GRINDER by Hill Acme Co.



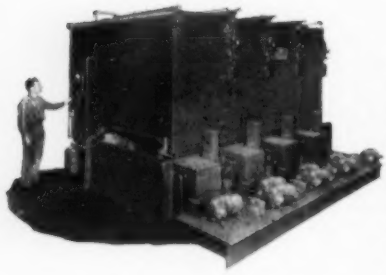
★ *Saves Floor Space*

★ *Reduces Material Loss*

★ *Equally Efficient for "Wet" or "Dry" Operation*



HILL ACME multiple head stainless strip grinder partially assembled showing the two-roll heads for endless abrasive belts and the adjustable motorized steel billy rolls for increasing belt pressure against the steel strip. The belt on any head can be changed while others are in operation.



HILL ACME four head grinding and polishing machine for the progressive finishing of stainless steel strip. This unit will process material .010" to .250" thick and 50" wide and produce up to No. 4 finish.

This four head HILL ACME abrasive belt grinding and polishing machine requires only half the floor space of four conventional strip grinders. The flexible design permits the addition of any desired number of heads.

For heavy stock removal "wet" grinding is recommended with 600 GPM coolant. Sludge passes through the bottom of the machine to the filter unit. Tests prove that considerable less coiled material is lost than in previous methods. A built-in oil mist spray system is used in polishing operations. Rubber covered guide rolls, built into the machine, create the proper "break" angle of the strip over each billy roll to flatten the strip at the point of contact with the abrasive belt. The billy rolls are actuated vertically by hydraulic power to overcome the tension on the steel strip.

This unit is the result of thirty years of success in producing endless abrasive belt grinding and polishing machines for all types of ferrous and non-ferrous materials.

Complete details are available.

The HILL ACME Company

Also Manufacturers of:

"HILL" Grinding and Polishing Machines • "ACME" Forging Machines • "CANTON" Rotary and Alligator Shears • BAR-BILLET Shears • MATERIAL HANDLING Equipment • "CLEVELAND" Knives and Shear Blades • KLING Metal Working Tools.

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Let's Start at the Beginning

Time after time we have seen or heard of methods or process engineering which has started in the middle. This is costing industry hundreds of thousands of dollars yearly. These departments are the keystone to economic manufacturing. Yet, they start in the middle.

Newspaper headlines emphasize the importance of labor which tend to distort the balance of economic manufacturing responsibility. Cost of labor for each operation is one of the major considerations. Initial cost of the equipment is another. It seems that the balance of effort, however, is directed toward solving the labor problems while capital equipment investments are dodged simply by stating funds are not available.

Let's take a look at Japan. They have the lowest labor rate of any industrial country. Yet, they are the first to buy many of the highly automatic machines built in this country. Numerical control equipment and some of the newest innovations have been purchased by Japan before they were sold in this country. This equipment was sold to them not because of the labor savings and not because they were first to be offered the equipment. They start at the beginning and demonstrate confidence that the solution is correct.

We seem to either overlook or are not encouraged to utilize the engineers approach to a problem. The steps are quite simple.

1. Gather **all** the facts.
2. Evaluate and determine which facts apply.
3. Develop the formula for use of the facts.
4. Apply the formula.
5. Test the formula.
6. Evaluate the results of the formula.
7. Constant re-evaluation.

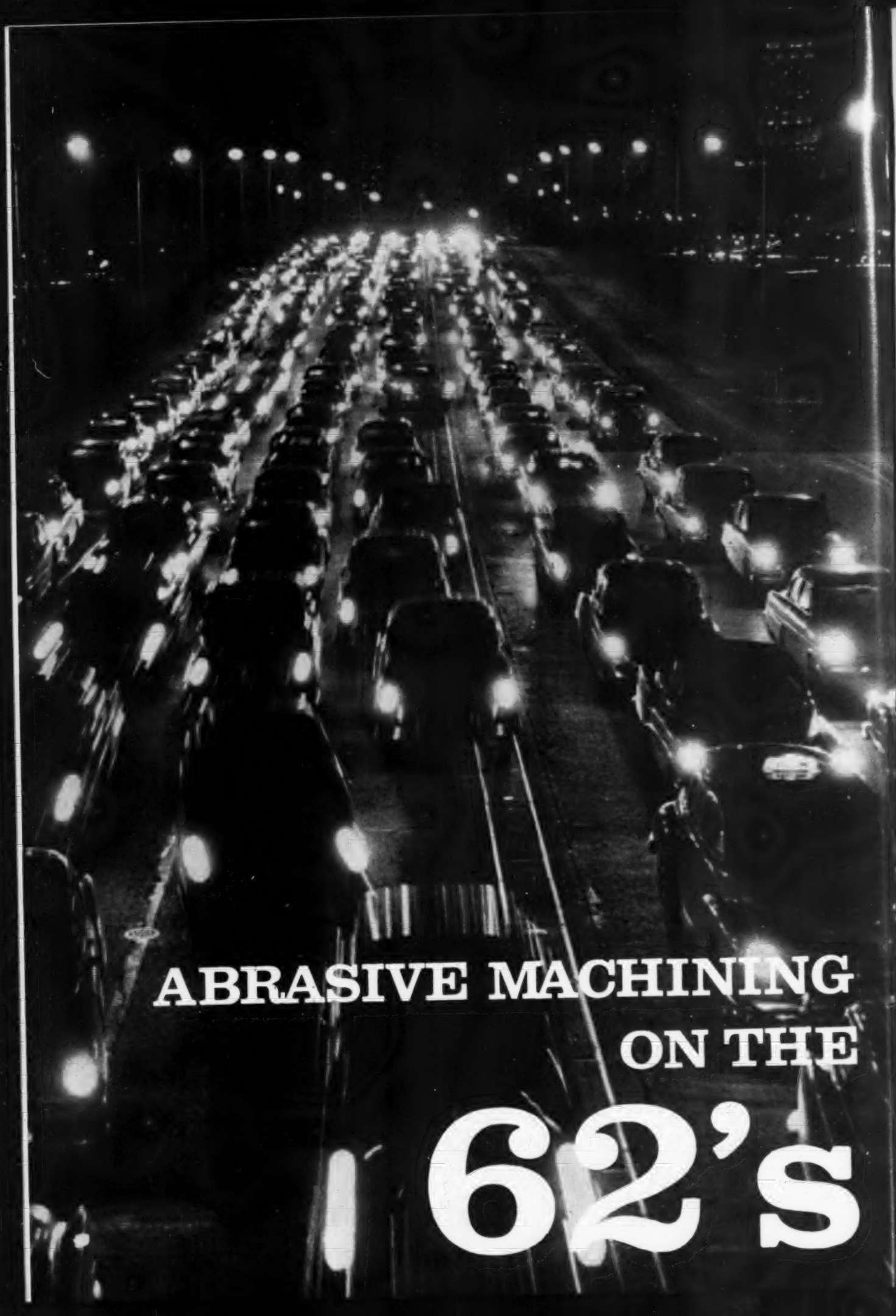
We are doing a good job on all the steps except the first two. The first two steps are taken very lightly or not utilized at all. This is the area in which other countries are gaining the advantage.

The gathering of all the facts and the evaluation of these facts is not encouraged by management. The uncovering of facts which indicate change is most often met with resentment and after several occasions the individual is looked upon as a troublemaker.

Selection of methods or processes must start at the beginning and be thoroughly evaluated. When this has taken place and changes are indicated they should be readily accepted and rewarded.

M. M. Patterson

Editor, Grinding and Finishing



ABRASIVE MACHINING ON THE 62's

On the following pages are photos and descriptions of many of the abrasive operations being performed on the 1962 cars. This article illustrates the type and quantity of abrasive machining being conducted by this important segment of the metalworking industry.

$20,000,000* spent on abrasives by the automotive industry.

$325,000,000* sold to all industry.

These estimated figures are significant. They point out the relationship of the automotive industry to the rest of the metalworking industry in the use of abrasive machining. While the photos and captions on the following pages display many abrasive operations which are exploited by the automotive industry, they also illustrate that this industry has not taken full advantage of abrasive machining.

Understanding

The operations being performed are highly refined. However, in many of the plants visited, the personnel did not demonstrate a thorough understanding of the requirements of the operation or a basic understanding of the processes. This is not surprising, as there are very few abrasive specialists or engineers employed by the automotive companies. Those who are do not hold positions with authority in relation to their responsibility. This is in spite of the fact that every machining operation in these plants is dependent on abrasives. Those operations which are not using abrasives directly, such as other metal cutting and metal forming operations, depend upon abrasives for tool sharpening and die finishing and forming.

Amount of Abrasive Machining

When questioned about the percentage of metal cutting or metal removal operations performed by abrasive machining, most of the companies had to make estimates. These ranged from 2% to 30%. There seemed to be some confusion over whether this figure represents operations or amount of metal removed. Metal removed would, of course, be small and does not represent a true picture of the involvement of the industry with the processes. From observation while in these plants, the percentage of metal removal operations performed by abrasives should average about 25%.

The estimated amount spent on abrasives alone is $3.60 per car. The total cost of abrasive machining per car is, of course, higher. There are two reasons for this low cost: abrasive machining is an economical method of stock removal and it is not being used to the full potential.

Efficiency

Still another point which was raised during the gathering of this material was the percentage of efficiency of metal removal operations. Most of the automotive industry establish that the machines installed will produce at 80% or even less of capacity. Abrasive machining is rated at 90% efficiency. The explanation is that there is less downtime required for abrasive operations. Grinding wheels or abrasives being used remain sharp cutting throughout their life which exceeds that of tooling in almost all cases. Where a dulling or shape problem does exist, automatic dressing or truing eliminates machine downtime. Set-up time is also greatly reduced on abrasive operations.

Operations

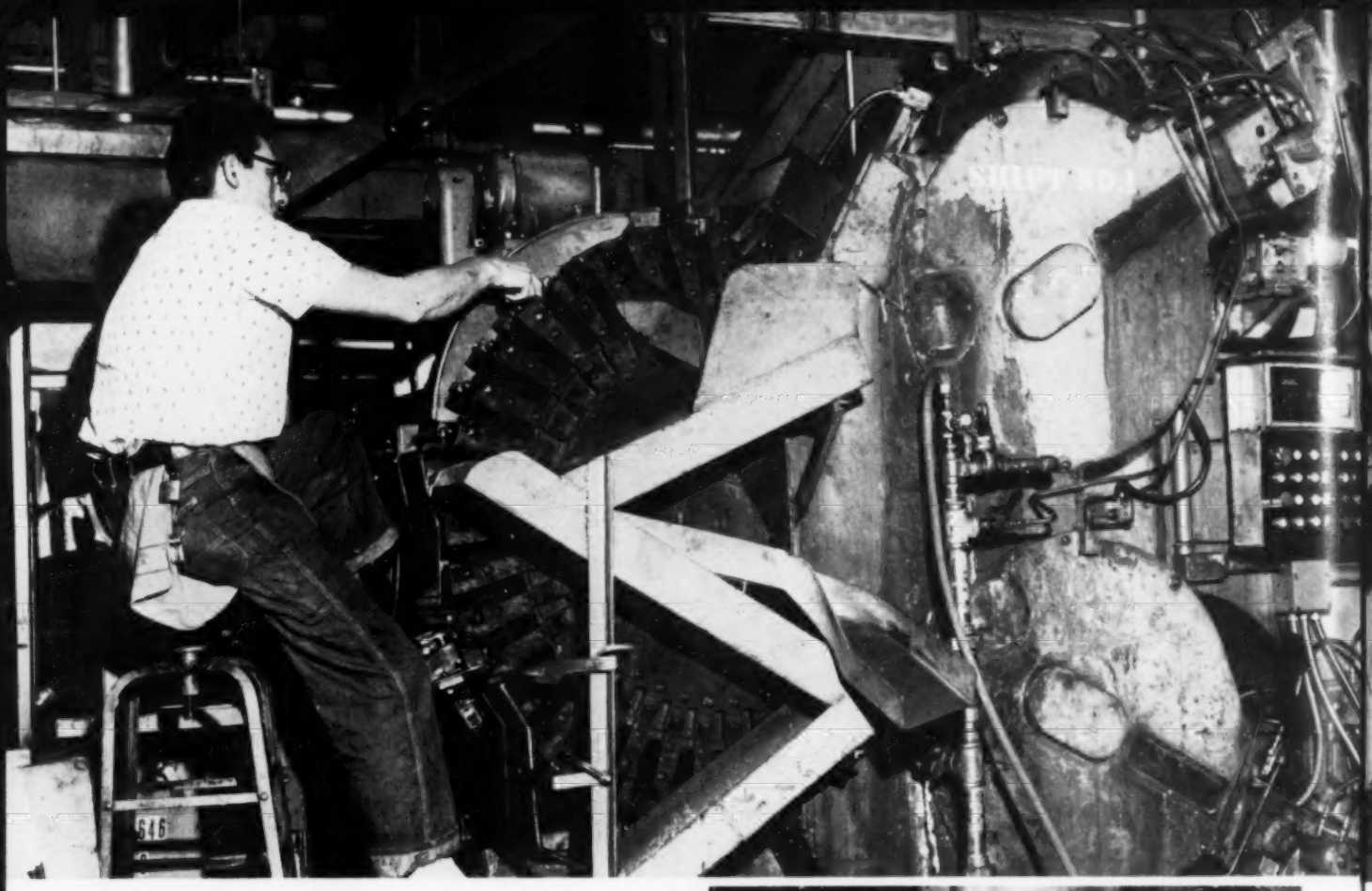
The highly developed abrasive machining operations in the automotive industry include; crankshaft grinding, camshaft grinding, connecting rod grinding and honing, valve grinding, piston grinding, axle grinding, cylinder bore honing, body finishing, bumper bar stock and bumper bar finishing, trim finishing, gear grinding and finishing, wrist pin grinding, grinding of housings and bodies, pump shaft grinding, deburring, toolroom grinding, steering knuckle grinding, and rotor shaft grinding. There are still other highly developed abrasive machining operations performed by suppliers on the many supplied parts such as glass, bearings, etc. These were not covered.

It is interesting to note the various amounts of stock removal indicated on the operations illustrated. Many of these are higher than the .010″ to .020″ considered by most people to be the maximum for most abrasive operations.

In these captions you will note a wide variation in stock removal, finish and tolerance. Many have been refined to a high degree with relation to the pre- and post-operations. Many operations not shown were still employing equipment or processes long since abandoned by the more progressive plants. Even some of the operations illustrated which were selected from those chosen by the plant personnel, are not the most advanced equipment or process.

*Bonded and coated only.

By M. M. PATTERSON, Editor



OLDSMOBILE F-85

1. Operation: Rough and finish grind double radius on valve stem pad of rocker arm.
Material: Perletic malleable iron.
Hardness: Rockwell C-50 Min.
Tolerance: Relationship of 24" radius to center line of shaft hole ± .0002".
Finish: 15 to 20 rms.
Machine capacity: 1207 parts per hour.
This is a two wheel grinder which takes the part from a rough cast surface to finished size. Stock removal is .015" - .020" on first pass and .003" - .005" on second pass.

2. Operation: Rough grind faces—both ends—conn. rod.
Material: Steel S.A.E. 1139.
Hardness: Brinell Range 180-228.
Stock removal: Spindle No. 1—rough crank end —.040" to .060". Spindle No. 2—rough pin end—.040" to .060". Spindle No. 3—semi-finish cr. end—.007". Spindle No. 4—finish pin (semi)—.003". Spindle No. 5—finish crank end (semi)—.003".

3. Operation: Grind valve guide to length.
Material: Cast iron.
Hardness: Brinell Hardness 163-207.
Stock removal: .030" per end.
Machine cycle: 4713 possible pieces per hour.

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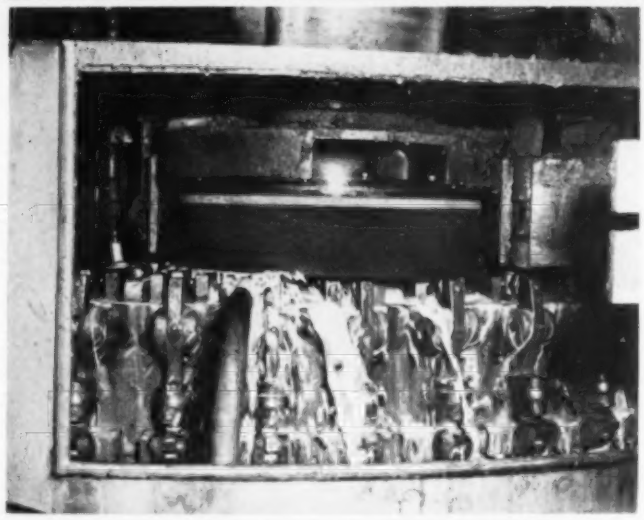

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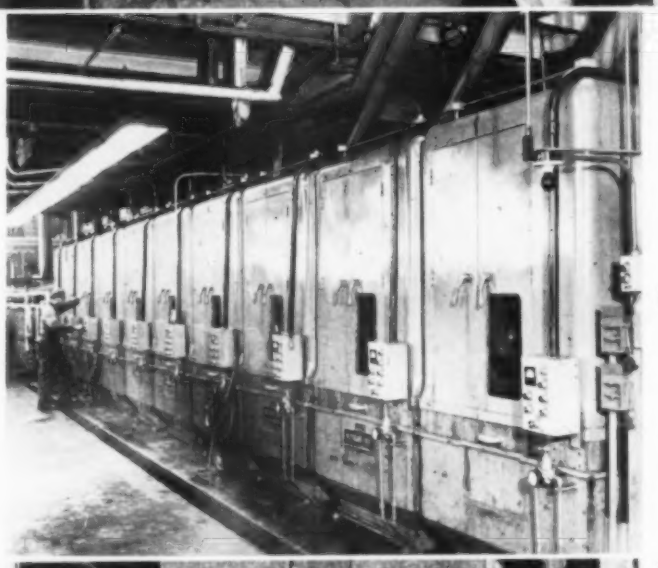
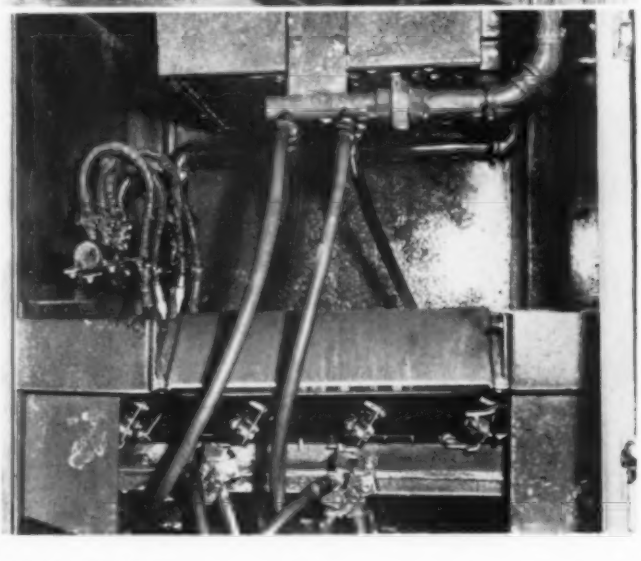


1.

OLDSMOBILE 98

2.

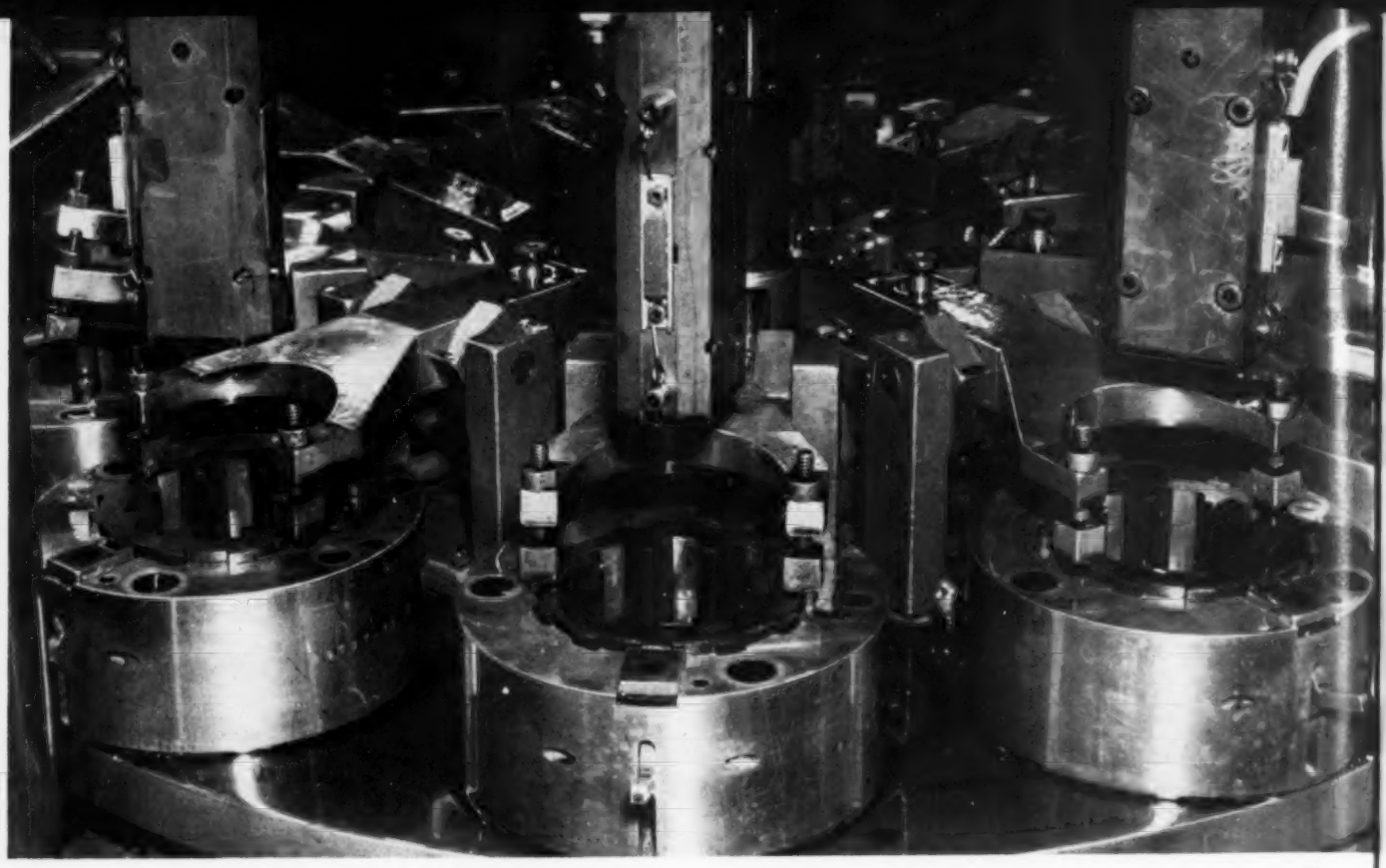
1. Operation: Buffing bumpers after copper plating and prior to nickel plate. The buffing operations are done automatically on horizontal return type conveyors, using buff heads arranged to contact the entire outside surface of the bumper.
Finish: Must be free of defects and buffed to a high lustre. The work travels past the buffing heads at 20 fpm. The buffing wheels revolve at a speed of 6000 sfpm. Tripoli compound is used as the polishing medium.



3.

2. Operation: Polishing bumpers in the flat prior to forming. This polishing is accomplished by the use of electrostatically coated abrasive belts in a group of units set in tandem. Abrasive runs from 100 - 220 grit.
Material: Low carbon CR steel.
Hardness: 45 Rockwell "B".
Finish: 10 rms or lower. The material travels through the machine at a rate of 45 fpm. The abrasive belt cuts at the rate of 5000 sfpm.

3. Operation: Liquid hone or pressure blast ball socket of rocker arm to remove heat-treat scale.
Material: Perletic malleable iron.
Hardness: Rockwell C-50 min.
Tolerance: Must not deform .3125 spherical dia. —Ball seat.
Finish: Must be free of heat treat scale—satin finish.
Machine capacity: 3000 parts per hour.



1.

BUICK SPECIAL

2.

3.

1. Operation: Hone 8 free wheel cams, surface.
Material: Steel—S.A.E. 1062 Modified.
Hardness: 70 Rockwell "C".
Tolerance: Cam surfaces must be square with outside lug face within .001" T.I.R.
Finish: 10 Micro-inch Max.
Production capacity: Surface speed of hone—30'/minute. Stock removal in inches/minute .0031".

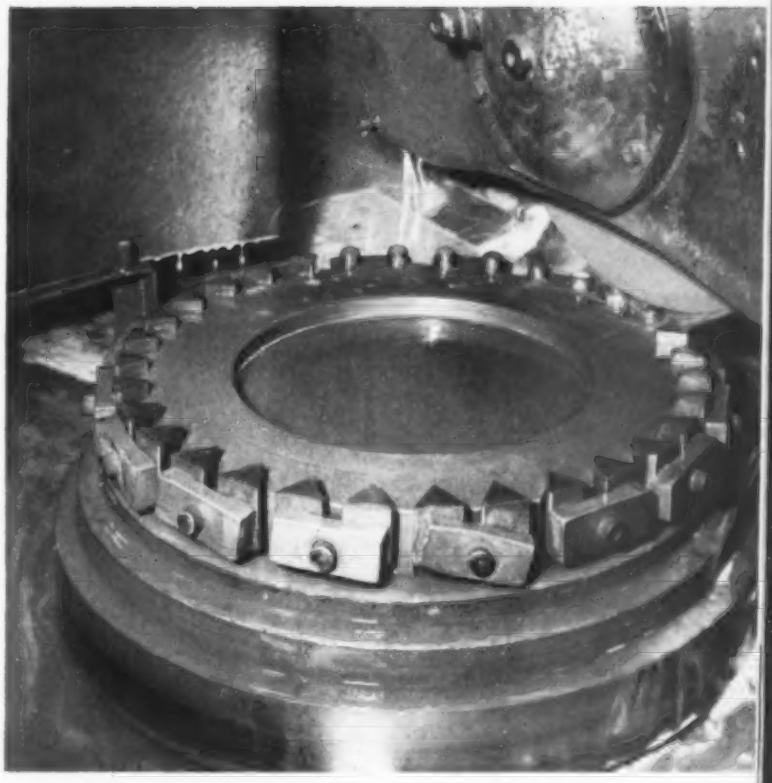
2. Operation: Deburring castings of oil pump body.
Material: Die cast aluminum.
Tolerance: Operation is a cleaning operation only.
Finish: Free from casting flash and fins.
Production capacity: 2 compartment machine, capacity—100 pcs. per machine

3. Operation: Elliptical grind 3.500 diameter of piston. (.016 ellipse on diameter)
Material: Aluminum alloy.
Stock removal: .012".
Tolerance: Thirteen size classifications of .003" per classification.
Finish: Not specified.

BUICK ELECTRA

1. Operation: Tool Sharpening.
Sharpen both ends of solid tungsten carbide inserts (or slugs) ¼" inscribed circle, ⅜" inscribed circle, ½" round, ½" square, triangle and diamond shaped.
Machine: Rotary Surface Grinder. S.F.P.M. 5500; Feed .001 (Automatic); Grinding wheel vitrified silicon carbide; Size 16" x 1¼" x 5"; Grade G-60.
Tolerance: Remove .030" to .060" wear-land each end of tool.
Finish: 10 to 12 profilometer finish.
Production capacity: Fixture is designed to hold 32 tools and accommodates various styles of carbide inserts.

2. Operation: Finish grind .875" diameter spherical ball and 1.545" diameter shoulder of spline ball stock. (Remove .010" - .015" stock)
Material: S.A.E. 1062 Modified; Ball is induction hardened RC 58 min.; Depth of case .060" - .120".
Stock removal: .010" - .015".
Tolerance: .001" diameter ball; .003" diameter shoulder.
Finish: 20 Maximum Micro inches required. Grinder is not holding 20 maximum, therefore, a polishing operation follows.
Additional Information: Machine is a Precision Plunge Form grinder. Machine is completely automatic with high speed approach, variable wheel feed, spark out and withdrawal, which is controlled through simple and positive cam action. Automatic size control is gained through a positive stop.



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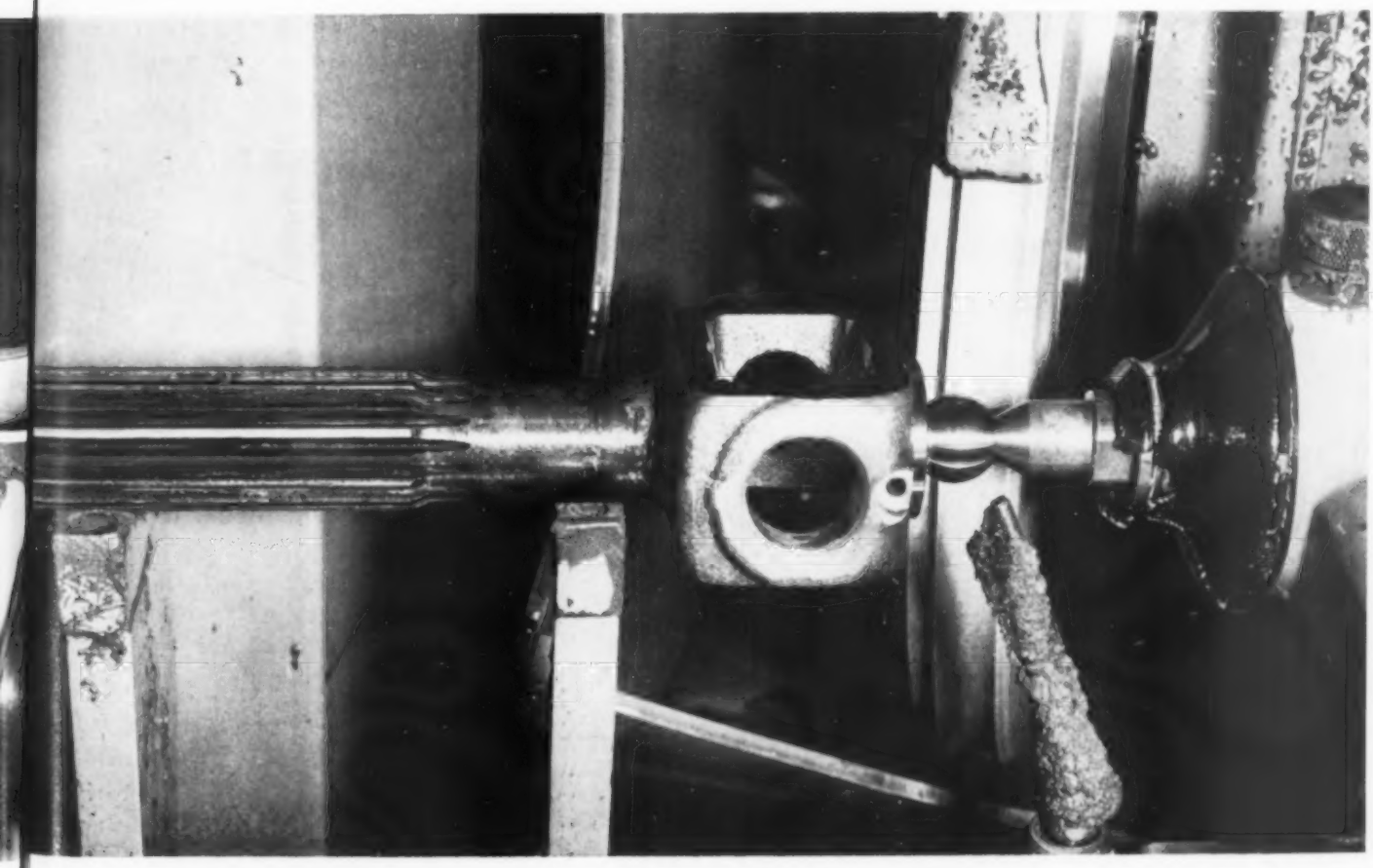

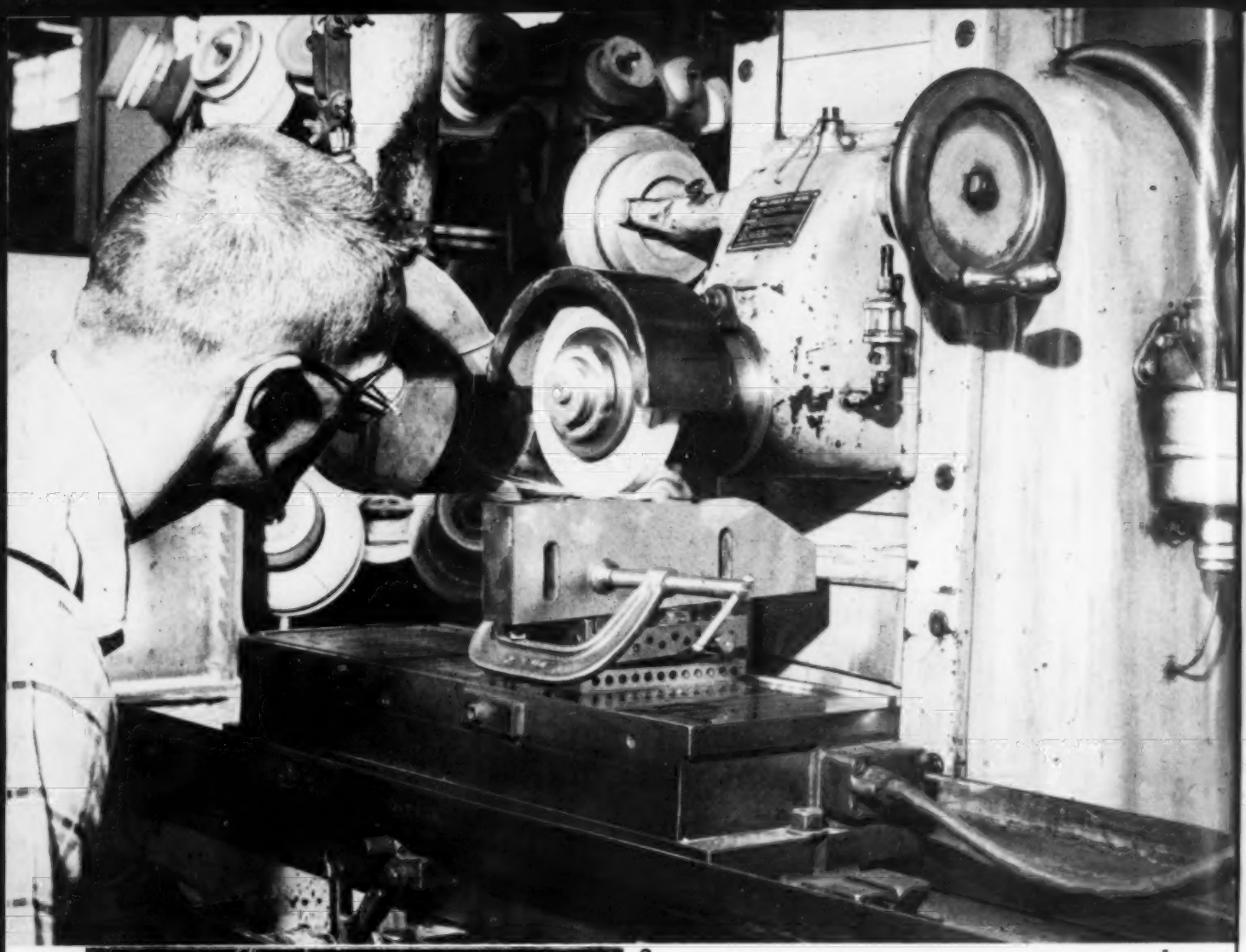

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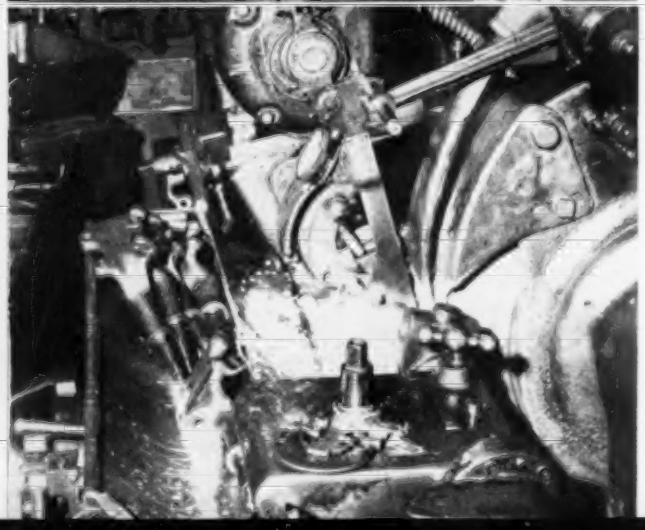
RAMBLER AMERICAN



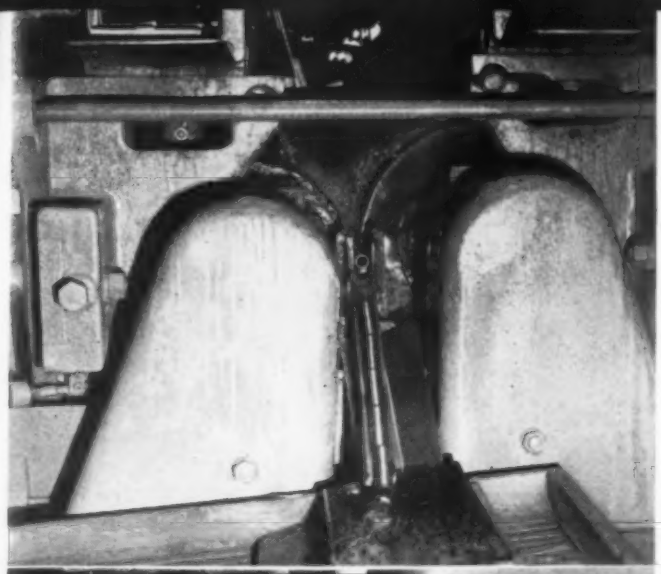
3.

1. Operation: Toolroom surface grinding of cam for Fay automatic lathe.
Material: Tool steel.
Tolerance: Within .0005" and parallel .0001".

2. Operation: Touch-up of body with portable wheel using set-up wheels.
Material: Sheet metal.
Finish: For appearance.

3. Operation: Grind knuckle pin.
Material: Forging 50-55 Rockwell "C".
Tolerance: Within .0005".
Stock removal: .008" - 010".
Machine capacity: 54 pins per hour.

STUDEBAKER LARK



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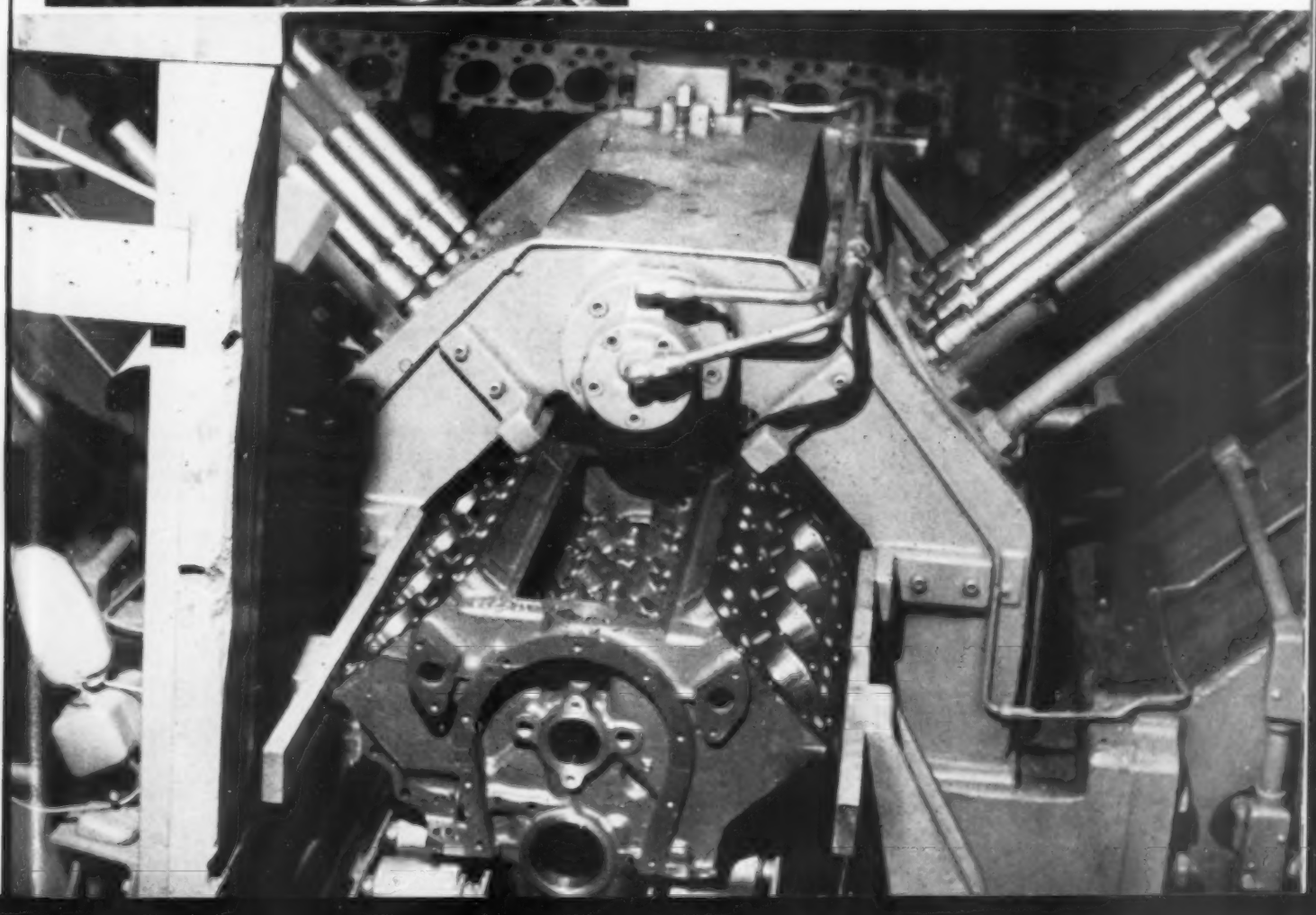
1. Operation: Centerless lapping piston pins.
   Material: 1118 steel, 75 to 80 Rockwell "C".
   Tolerance: Within .0001".
   Finish: 5-6 microinch.
   Machine capacity: 250 pins per hour.

2. Operation: Finish grind O.D. of piston.
   Material: Aluminum.
   Tolerance: Within .0005".
   Finish: 40 microinch.
   Machine capacity: 117 pistons per hour.

3. Operation: Finish hone cylinder block.
   Material: Cast iron.
   Tolerance: Within .001".
   Finish: 30 to 40 microinch.
   Machine capacity: 76 blocks per hour.



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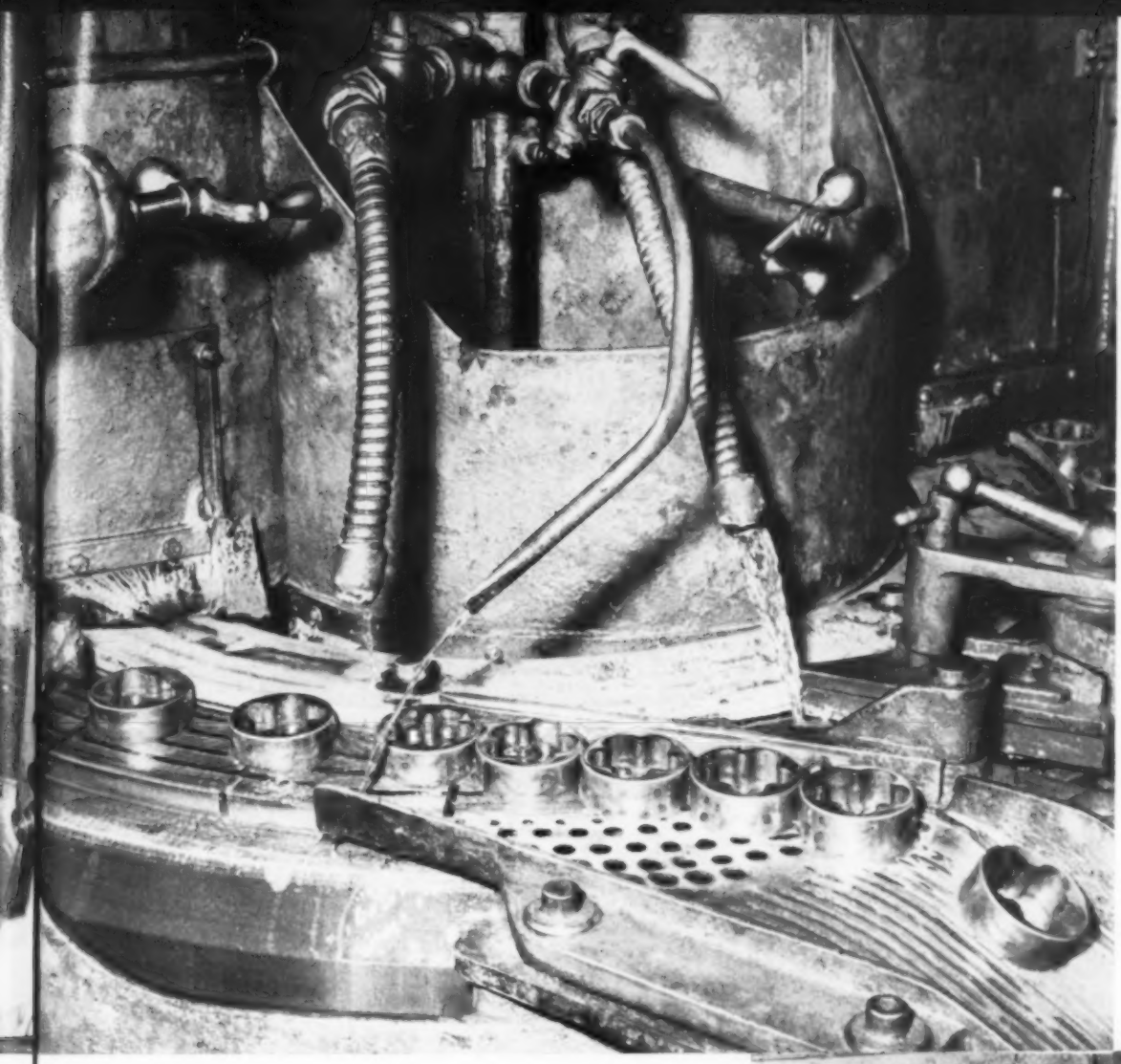
2.

PLYMOUTH VALIANT

1. Operation: Surface grinding of the connecting rod side bearing faces.
Material: Steel forging 228-269 Brinell hardness.
Tolerance: .0005" T.I.R.
Stock removal: .020" per side.
Production capacity: 1000 per hour.

2. Operation: Toolroom grinding of broach for resharpening.



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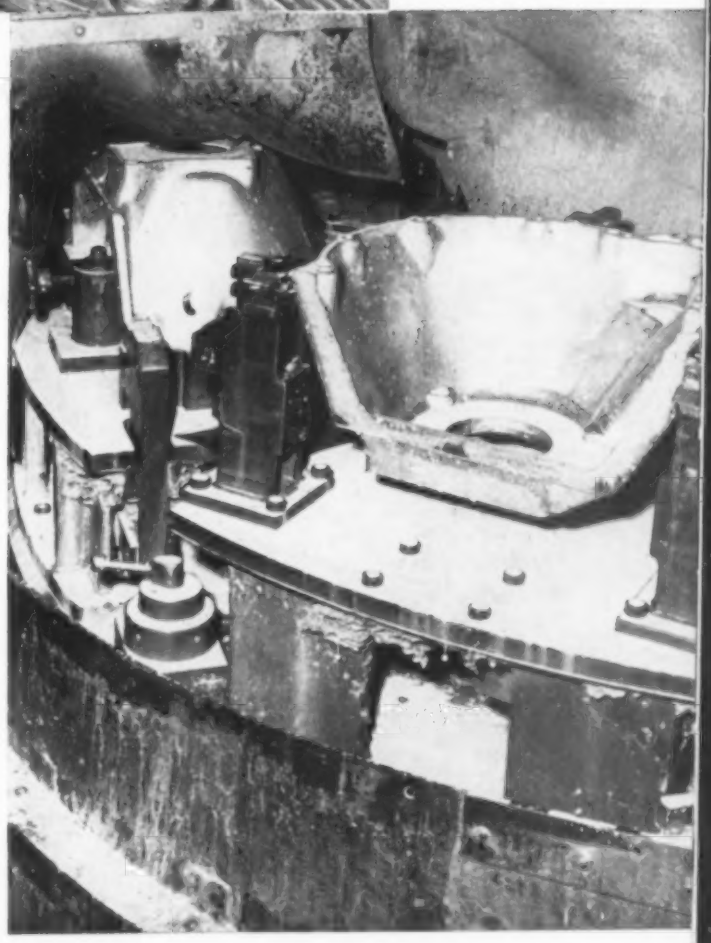
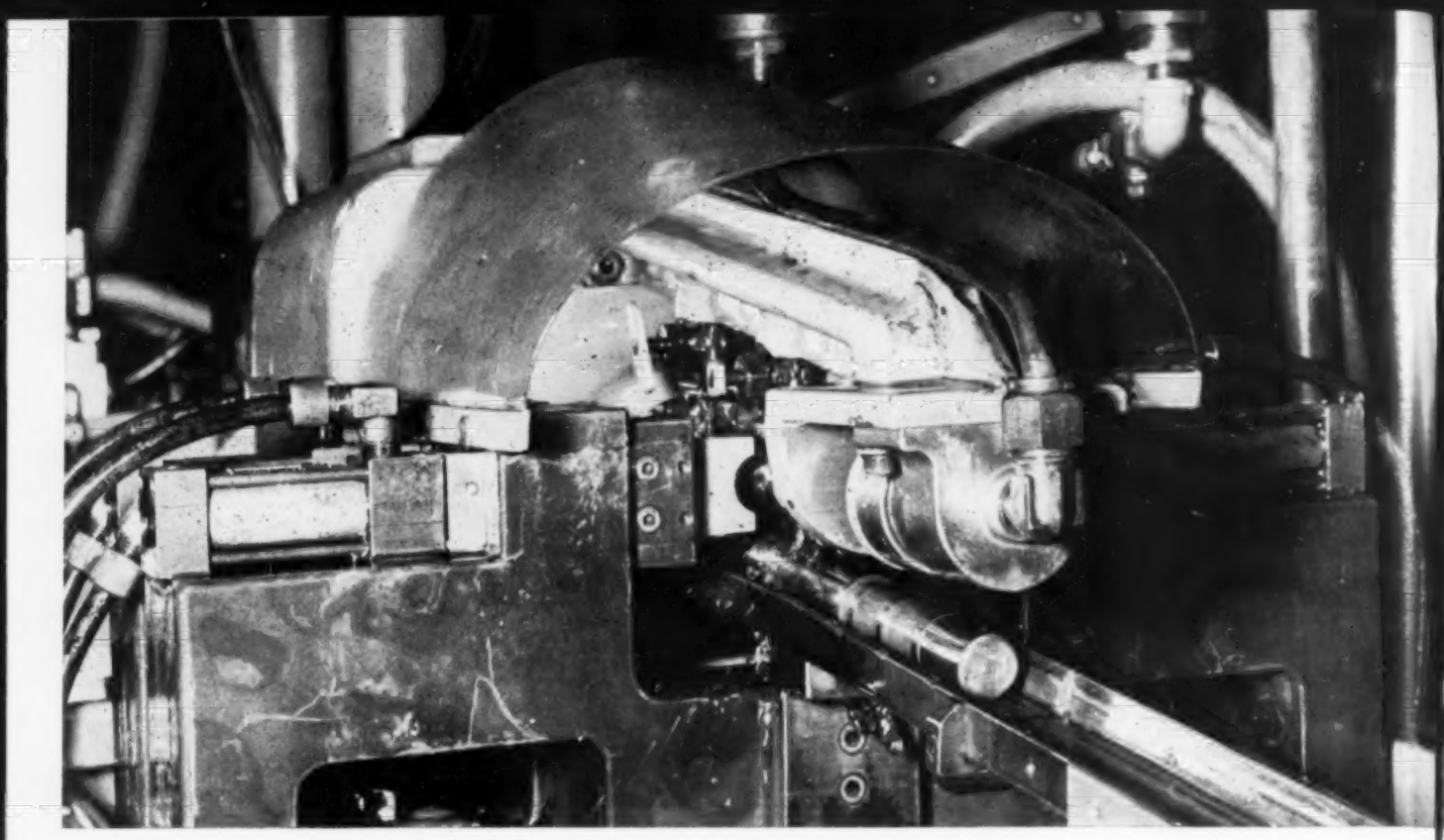
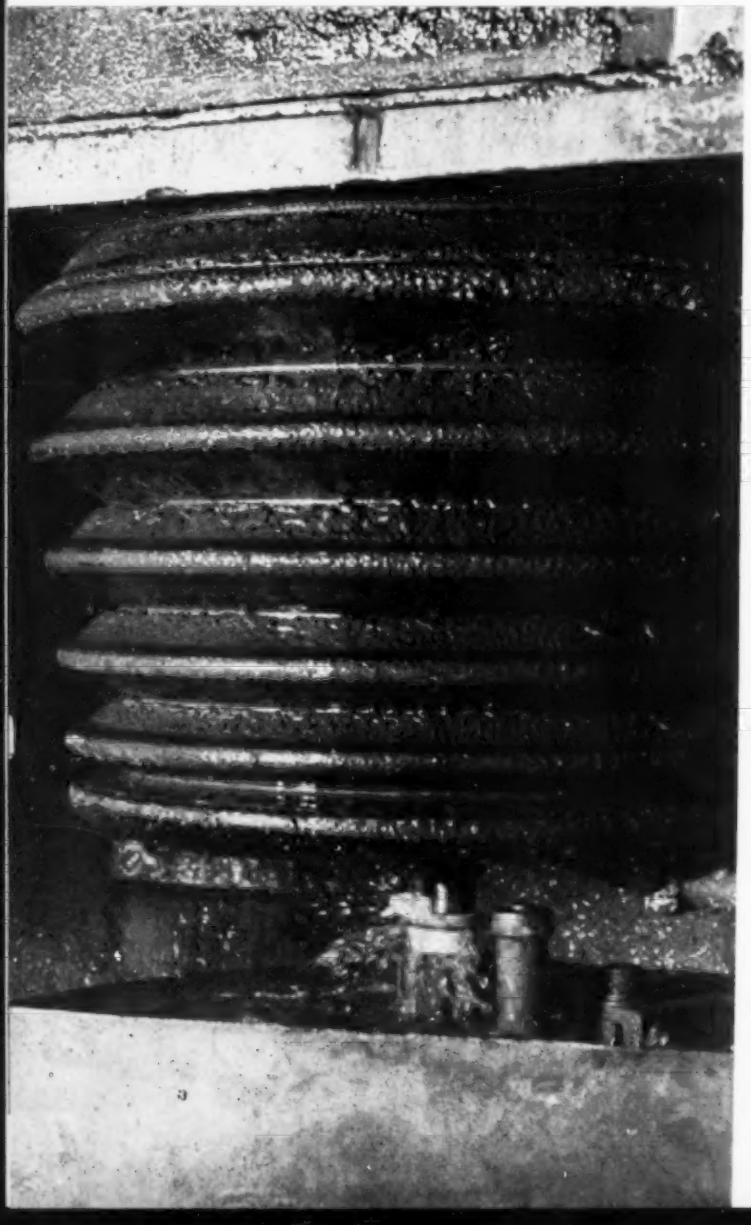


PLYMOUTH FURY

1. Operation: Surface grinding oil pump cover.
Material: Cast iron 130-127 Brinell hardness.
Tolerance: .001" T.I.R.
Production capacity: 212 parts per hour.

2. Operation: Surface grind clutch housing.
Material: Aluminum.
Tolerance: Within .010" each side for flatness.
Stock removal: .020" per side.
Production capacity: 100 per hour.





2.

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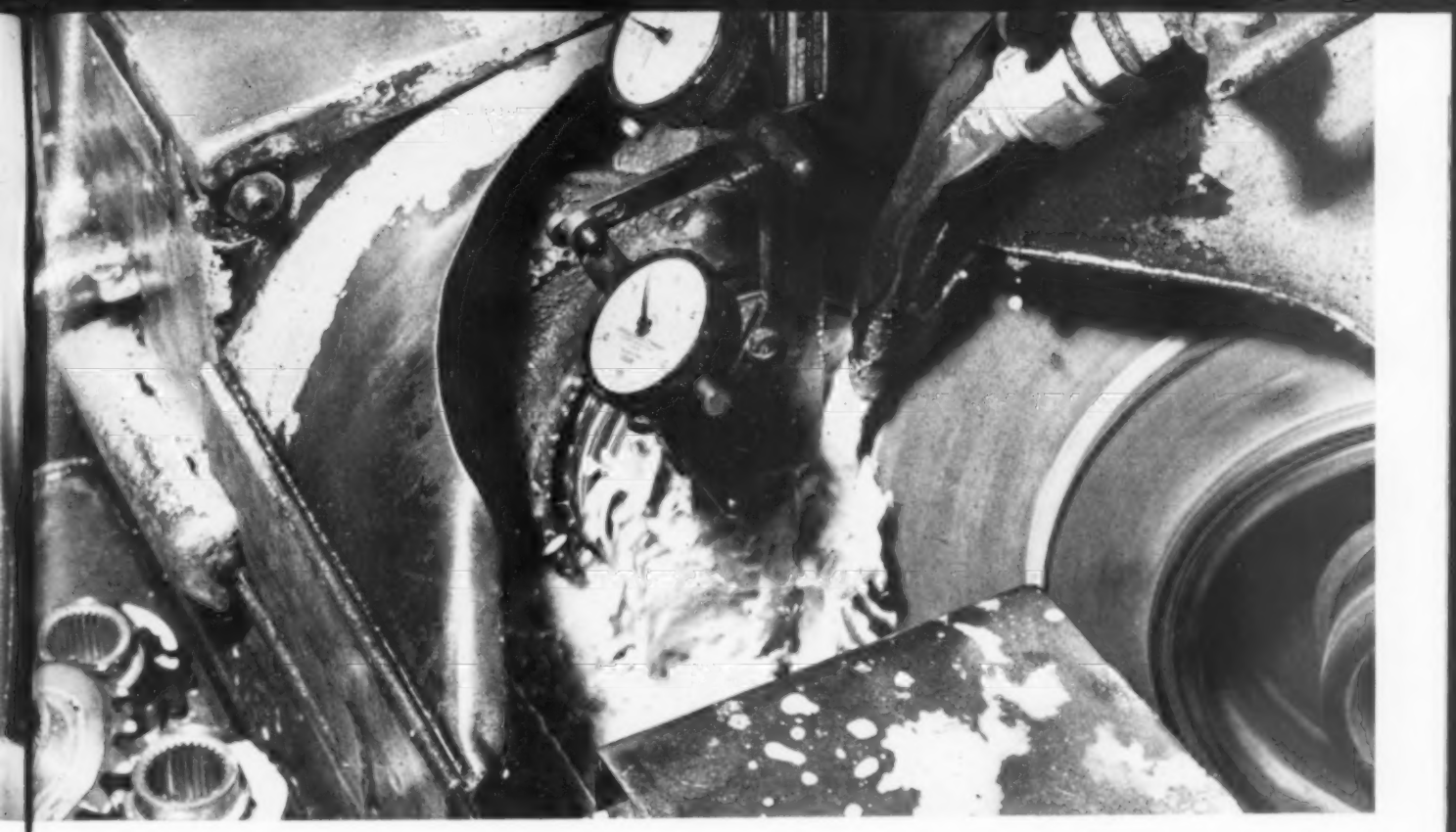
DODGE LANCER

1. Operation: Lapping O.D. of power steering pumpshaft.
Material: Steel—hardness Rockwell "A" 80-82.
Tolerance: .0004" O.D., .0005" T.I.R.—held to 65 microinch for roundness.
Finish: 15 rms.
Stock removal: .0001".

2. Operation: Vertical cam grinding of cam insert for power steering pump.
Material: Pearlitic malleable iron Rockwell "C" 50.
Tolerance: Elliptical hole must be held to .0002" at the blend point with a T.I.R. .001".
Finish: 9 - 15 rms.
Stock removal: .010" - .012".



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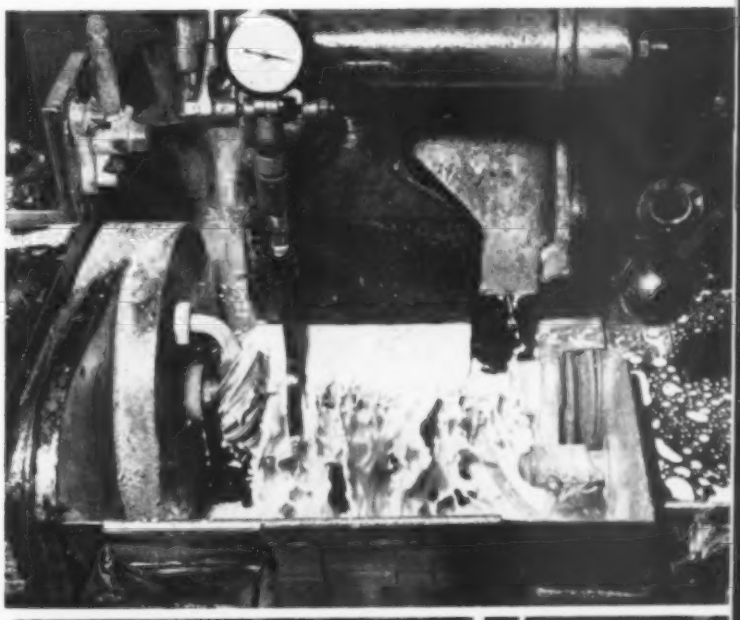
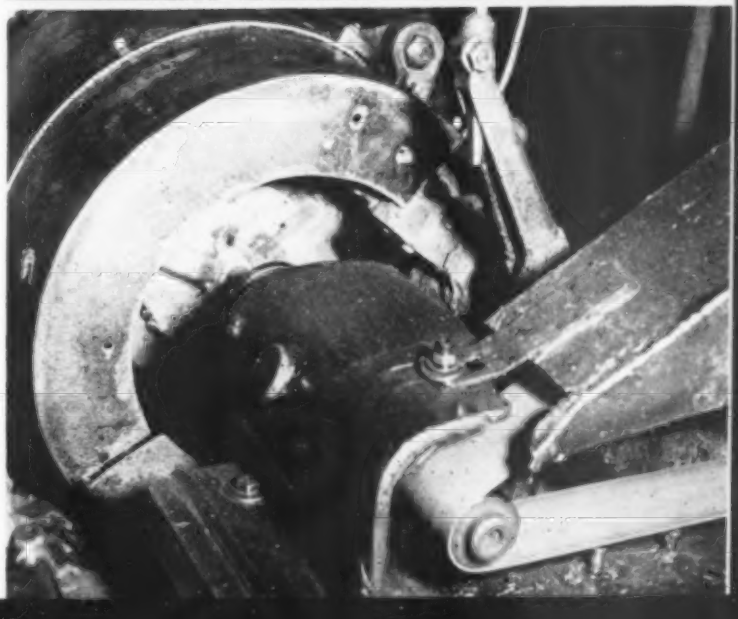


DODGE POLARA

1. Operation: Finish grind hub diameter and back face of differential gear.
Tolerance: Within .001".
Stock removal: .015" on the diameter.

2. Operation: Grinding 2 bearing diameters and spline diameter of the rear axle drive pinion.
Tolerance: Within .0005".
Stock removal: .009".

3. Operation: Finish grind ID of differential pinion.
Tolerance: Within .002".
Stock removal: .006".



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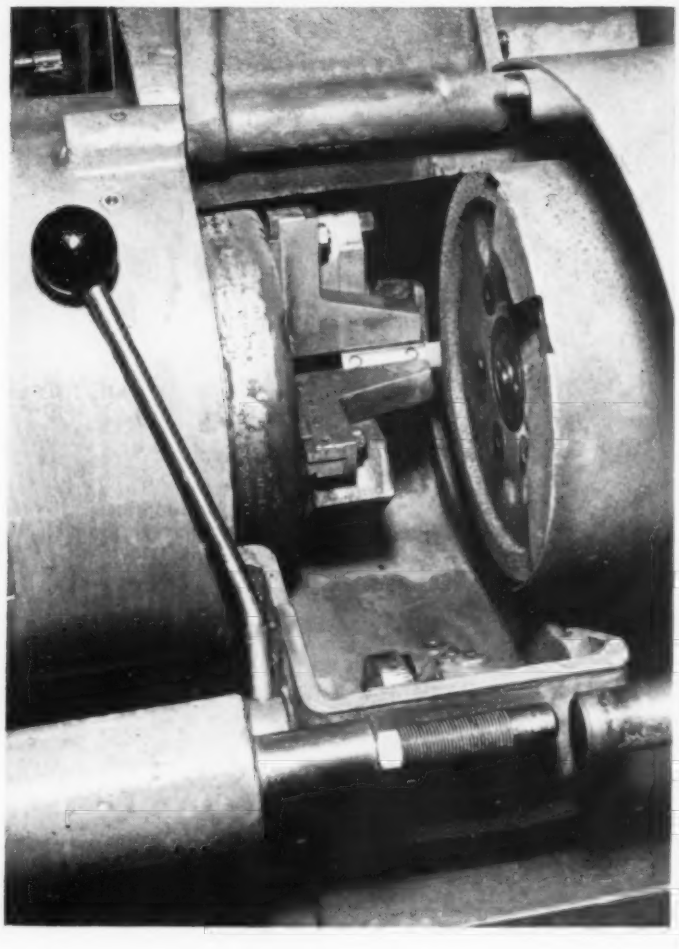
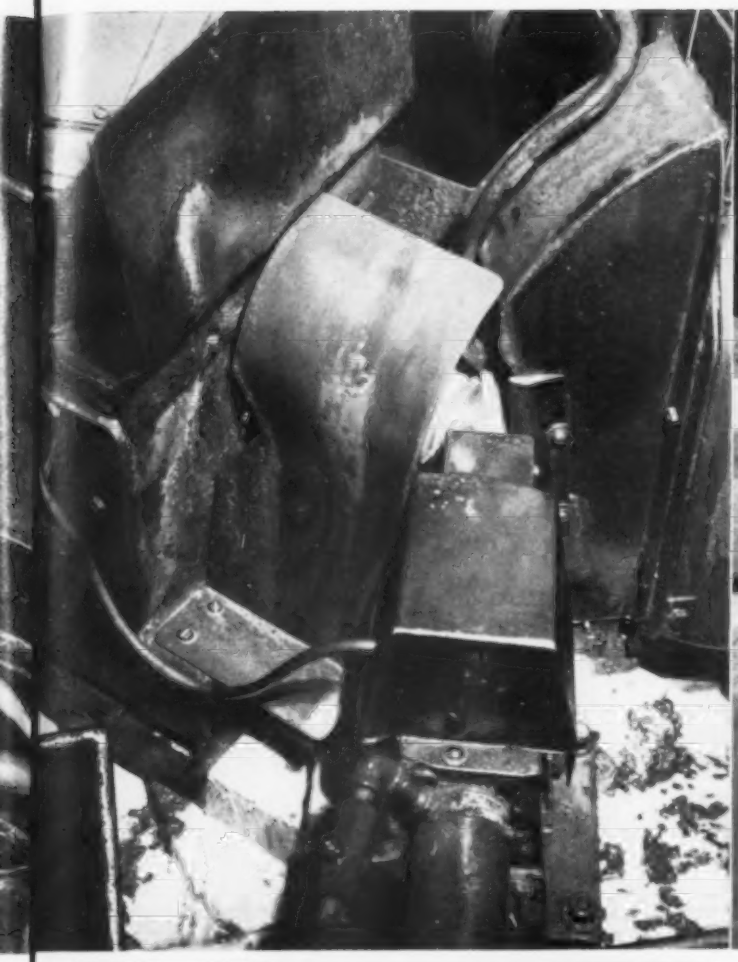
DODGE DART

1. Operation: Surface grinding water pump cover.
Material: Cast iron 130-187 Brinell hardness.
Tolerance: .003" T.I.R.
Finish: 80-120 rms.
Production capacity: 110 parts per hour.

2. Operation: Grinding the ID and square the end face of the steering pump rotor.
Material: MS-3498; Sintered metal 50 Rockwell "C".
Tolerance: Within .0005" on ID; .0003" for taper; .0001" squareness of face to ID.
Stock removal: .0003".





1. 2.

3.

CADILLAC FLEETWOOD

1. Operation: Spherical grinding of the right radius on differential side pinion.
Material: 1025 steel hardened to 59-60 C.
Tolerance: Within .001".
Finish: 30 rms.
Production capacity: 51 pieces per hour.

2. Operation: Polishing front grill fins prior to buffing.
Material: Extruded aluminum.
Finish: Four belts of progressively finer grit size are used, starting with 60 to 220 grit. Final finish is obtained by 6-head buffing machine, using aluminum buffing compound for a bright finish on the leading edge only.
Production capacity: 18 pieces per fixture; 56 fixtures per hour.

3. Operation: Honing of main bearings of cylinder block.
Material: Grey cast iron.
Stock removal: .004" on the diameter.
Tolerance: Within .0005".
Finish: 12-25 rms.
Production capacity: 35 pieces per hour.

CHRYSLER IMPERIAL

1. Operation: Superfinish oil seal and taper diameter of axle shaft.
Finish: 30 rms.

2. Operation: Crush form surface grind slipper for power steering pump.
Material: Fine grain killed aluminum with .010" to .015" case hardened to 77.4 minimum on Rockwell 30 scale.
Stock removal: Within .005".
Finish: 50 rms.
Tolerance: .0007" T.I.R.; thickness .041".

3. Operation: Centerless grind oil seal and taper diameter of axle shaft.
Material: MS-2934.
Tolerance: .0007".
Stock removal: .004".
Finish: 30 rms.

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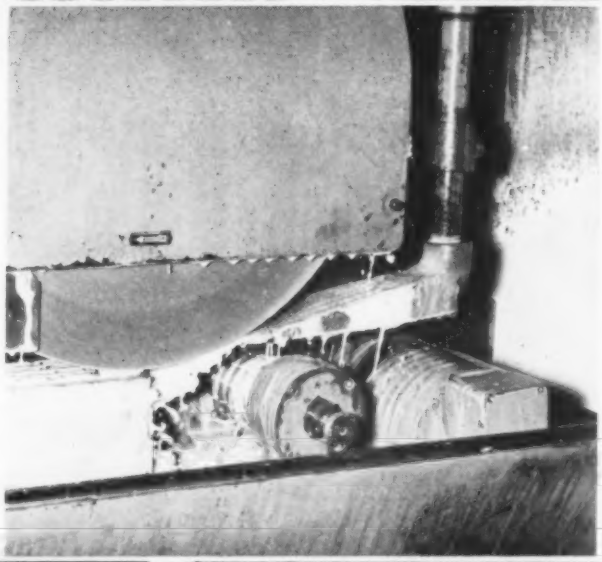

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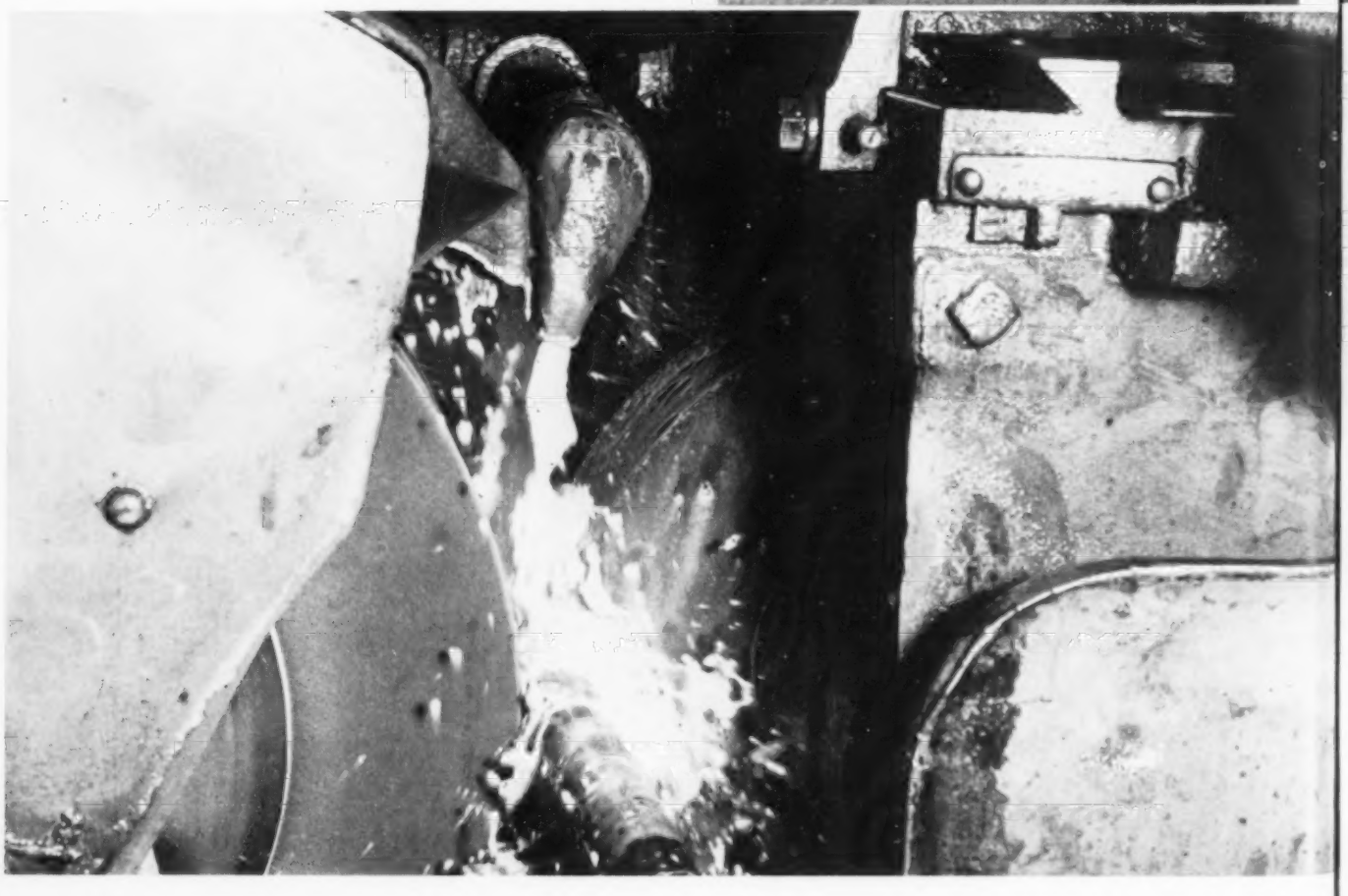
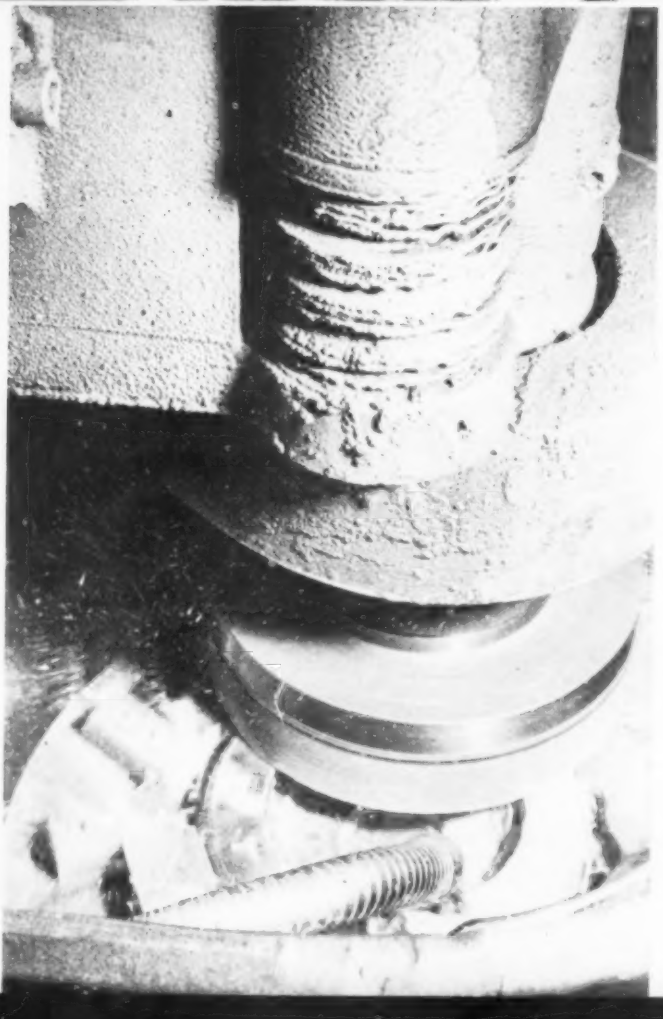




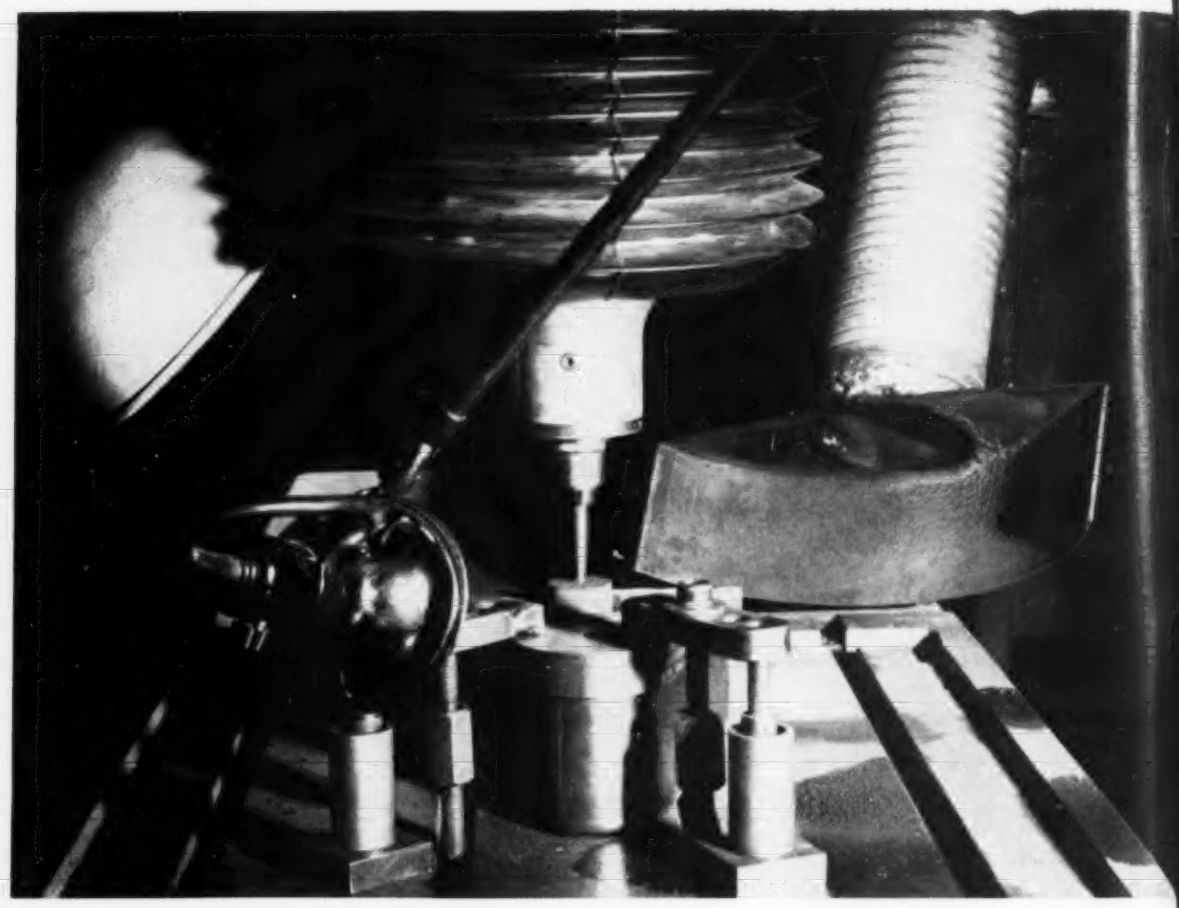
1.

2.

CHRYSLER NEW YORKER

1. Operation: Surface grind fly wheel clutch face.
   Material: Cast iron 156-217 Brinell hardness.
   Tolerance: Within .001" T.I.R.
   Stock removal: .045" - .050".
   Finish: 40-80 rms.
   Production capacity: 100 parts per hour.

2. Operation: Surface grind outer rotary.
   Material: Super oilite 593.
   Tolerance: Within .001" T.I.R. and .001" for size.
   Stock removal: .010" per side.
   Production capacity: 300 parts per hour.



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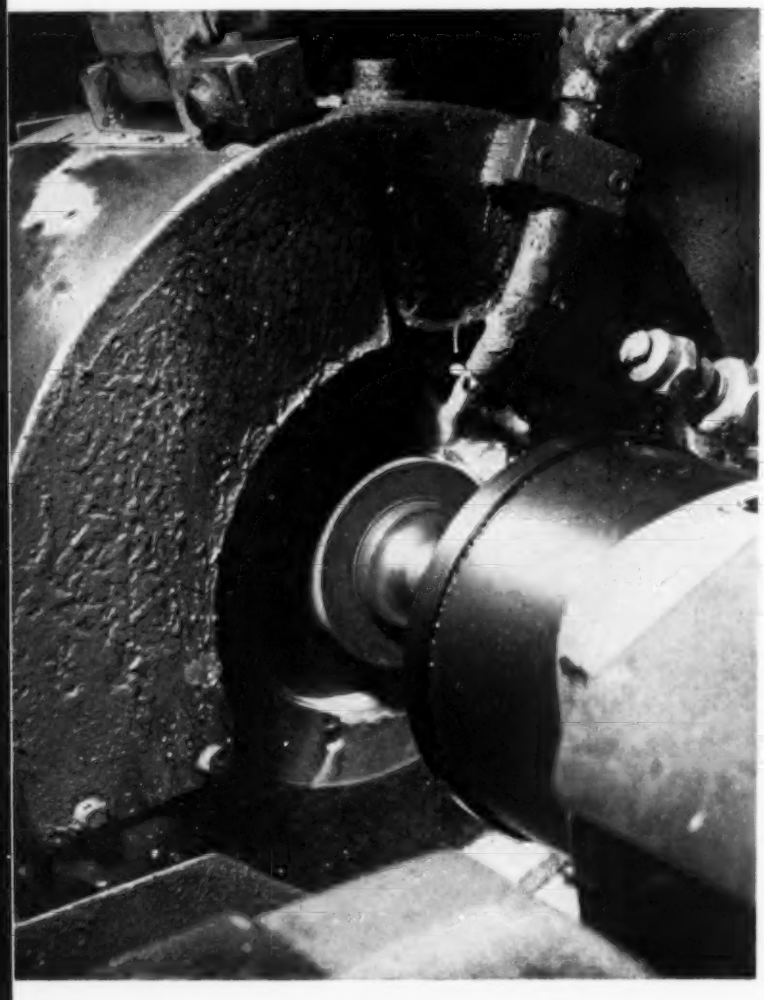
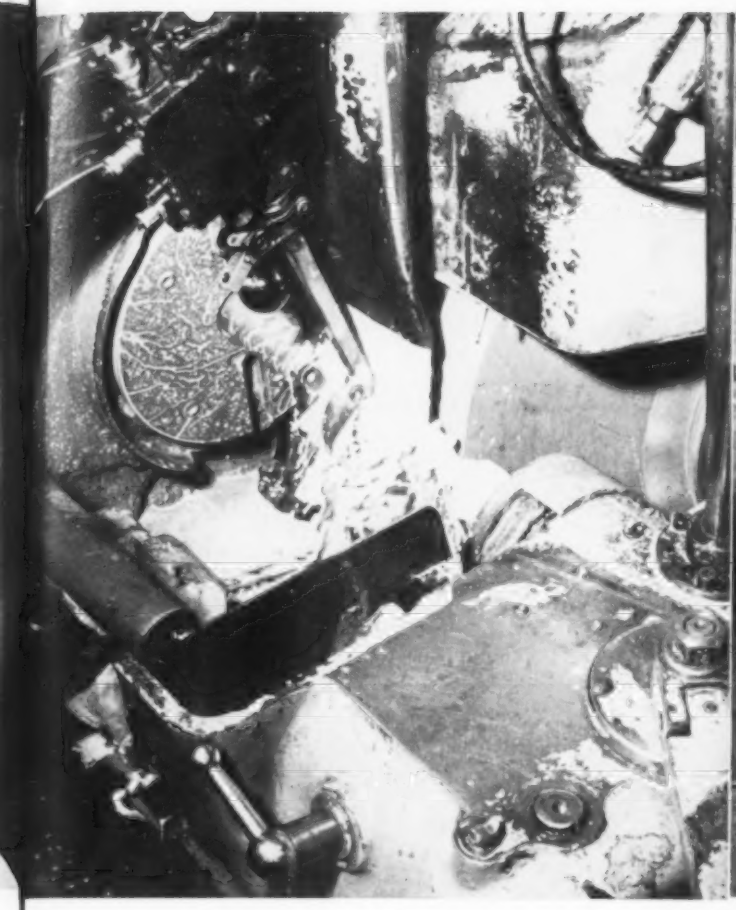


2.

CHEVROLET CORVAIR

1. Operation: Jig grind hub and back of differential side gear.
   Material: Forged Steel.
   Stock removal: .007" - .009".
   Tolerance: NOT REPORTED.

2. Operation: Internal grinding of I.D. in hypoid drive gear.
   Material: Forged Steel.
   Stock removal: .005" - .006".
   Tolerance: NOT REPORTED.



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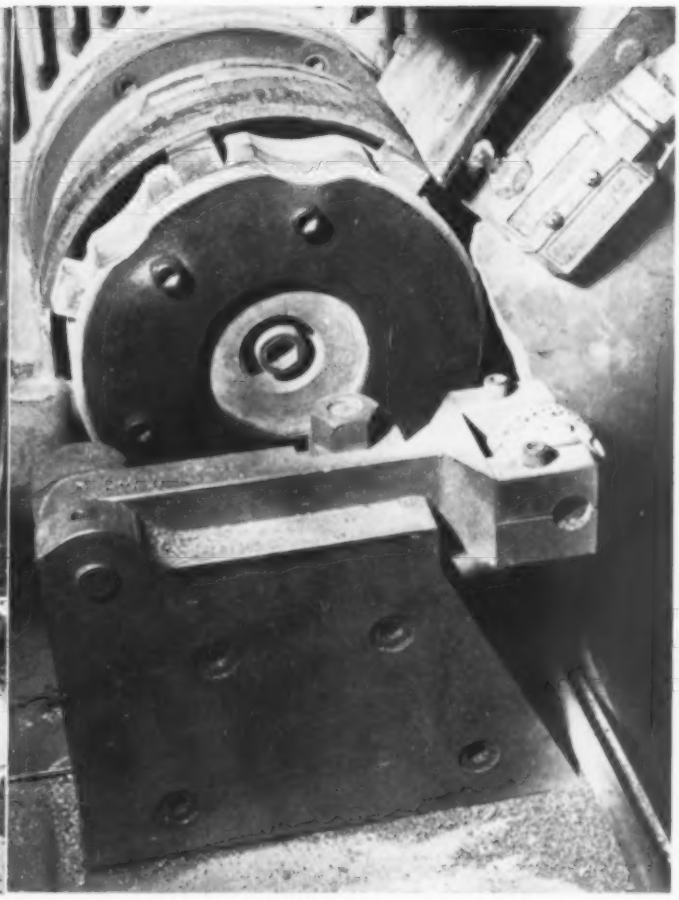


2.

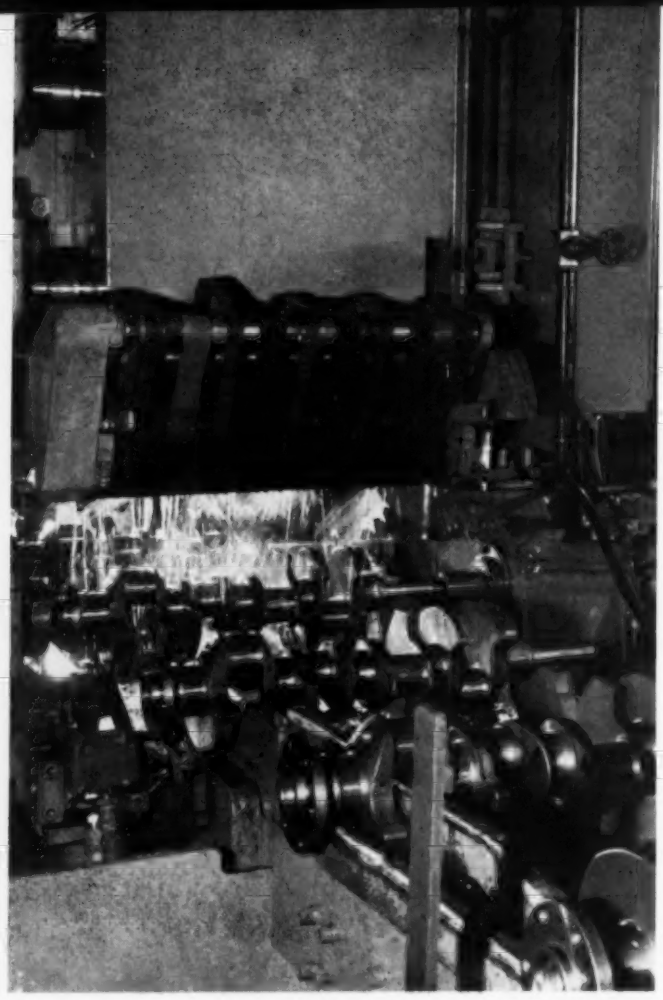
3.

CHEVROLET IMPALA

1. Operation: Finish grind two bearing diameters, oil seal diameter, shoulder and radii of steering knuckle.
Material: Forged steel.
Stock removal: .005" - .008".
Tolerance: NOT REPORTED.

2. Operation: Grind the face of rear brake shoe.
Material: Asbestos, resins, etc.
Stock removal: .035" - .045".
Tolerance: NOT REPORTED.

3. Operation: Finish grind full bearing diameter of axle shaft.
Material: Forged steel.
Stock removal: .012".
Tolerance: NOT REPORTED.



1.

FORD GALAXIE

1. Operation: Coated abrasive lapping of main and pin journals of crankshafts.
Material: Shell molded modular iron.
Tolerance: Within .0008".
Stock removal .0003" to .0004".
Finish: Below 12 rms.

2. Operation: Cylindrical grind outer rim of outer race ring.
Material: SAE 5060 hot roll steel.
Tolerance: ± .0005".
Finish: 50 rms.
Production capacity: 189 parts per hour.

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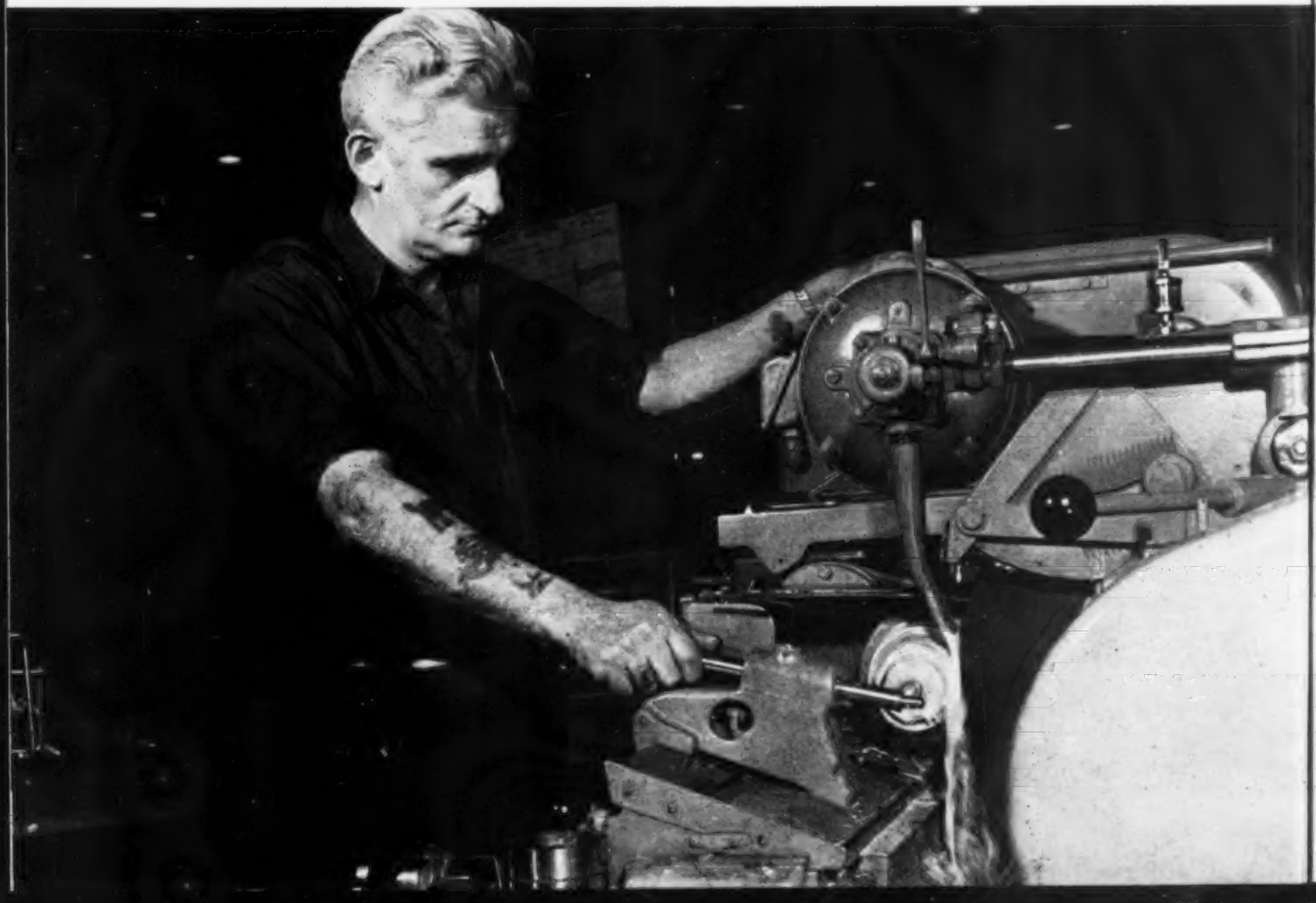
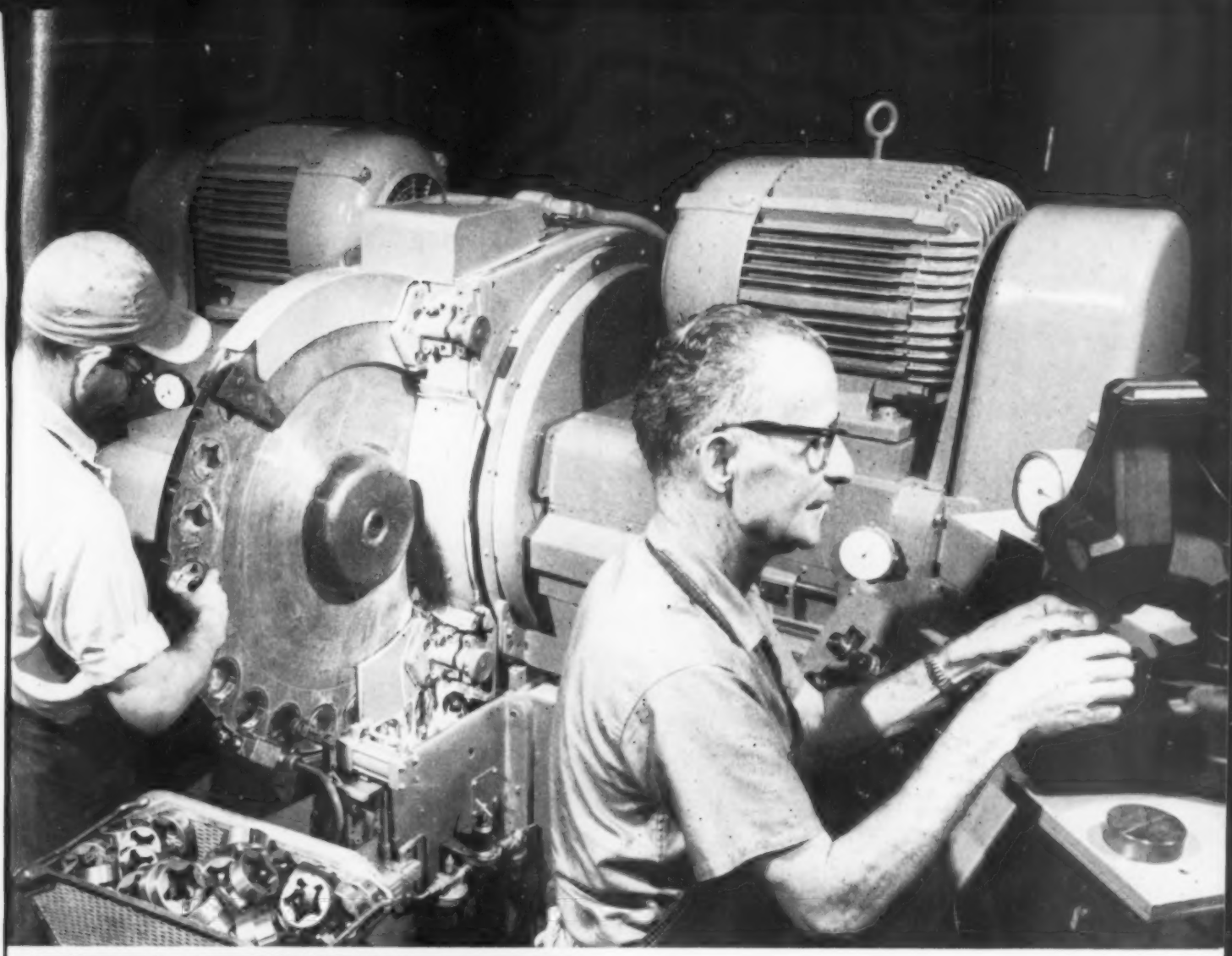




2.

1.

FORD FALCON

1. Operation: Grind both faces of outer rotor—oil pump.
Material: Sintered Iron.
Finish: 75 Micro.

2. Production: Grind head diameter and chamfer.
Tolerance: .015" for diameter and .005" for runout.
Production capacity: 2700 parts per hour.

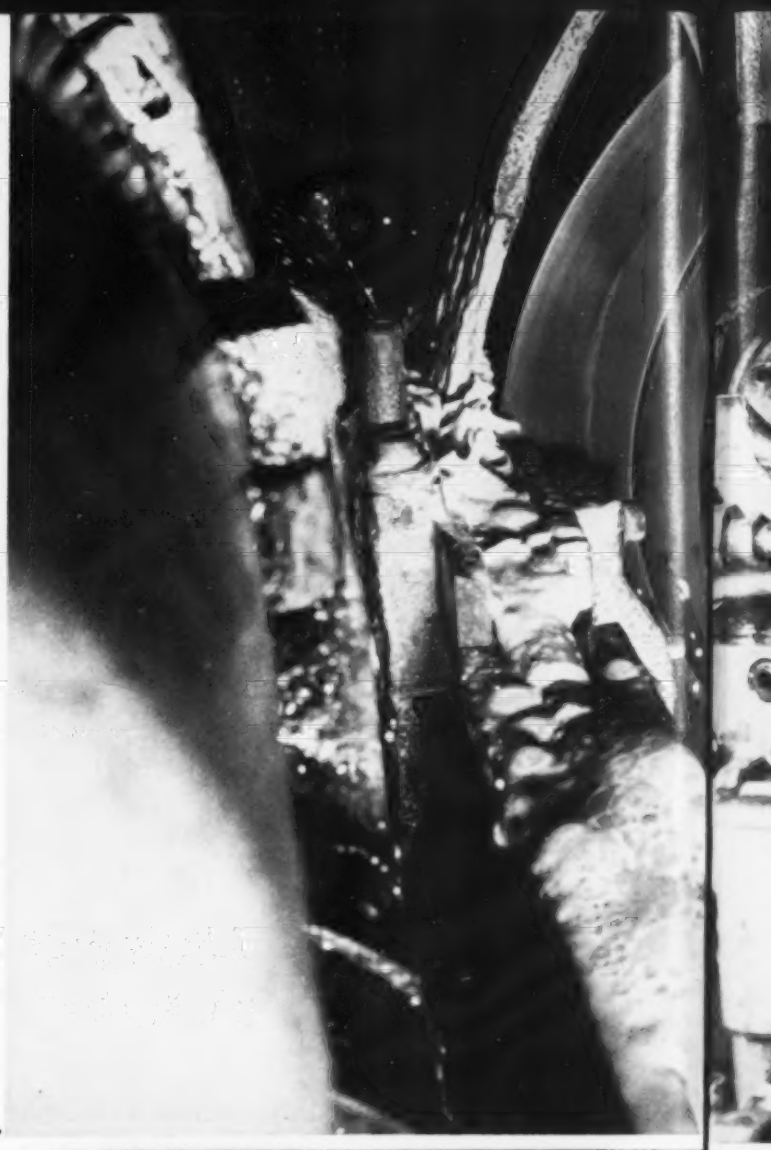
1.

FORD LINCOLN

1. Operation: Deburr gear and journals of the forward sun gear.
   Materials: SAE 5132 steel forging.
   Production capacity: 96 parts per hour.

2. Operation: Centerless "green" grinding of wrist pins.
   Material: SAE 5015.
   Tolerance: Within .0003" and weight must be held between 186-188 grams.
   Finish: 6 rms.

3. Operation: Centerless form grinder retainer groove, wiper groove, chamfer foot of exhaust valve.
   Material: Austentic cast iron.
   Tolerance: Within .005" from groove to groove; .010" for diameter.
   Stock removal: .053" to .041".



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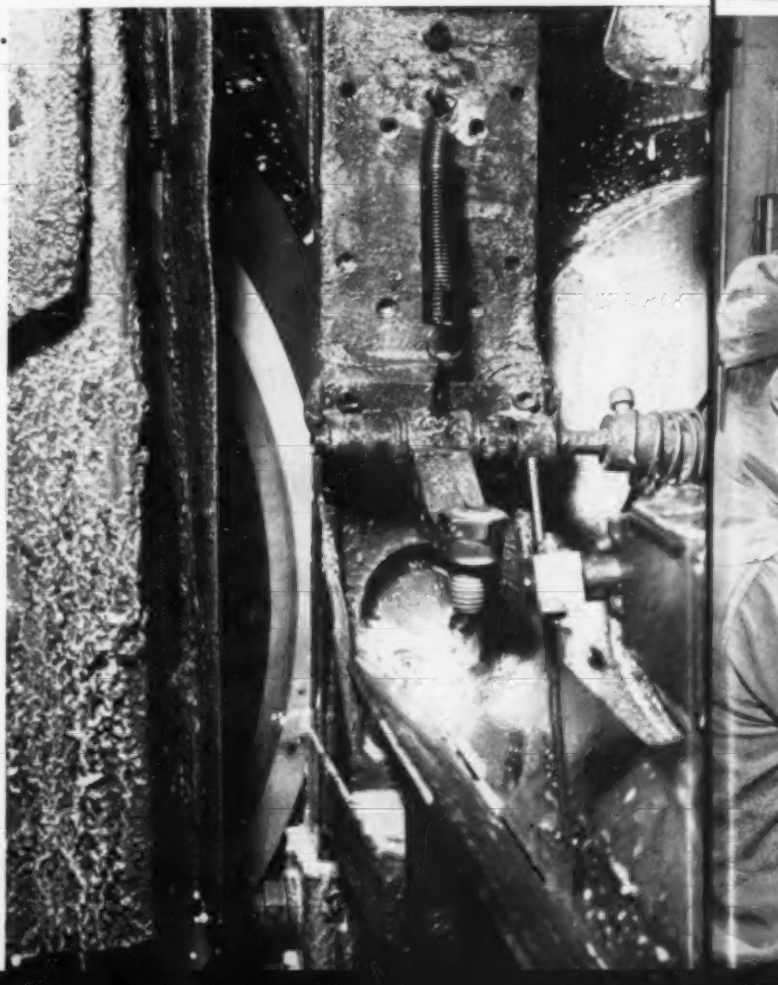

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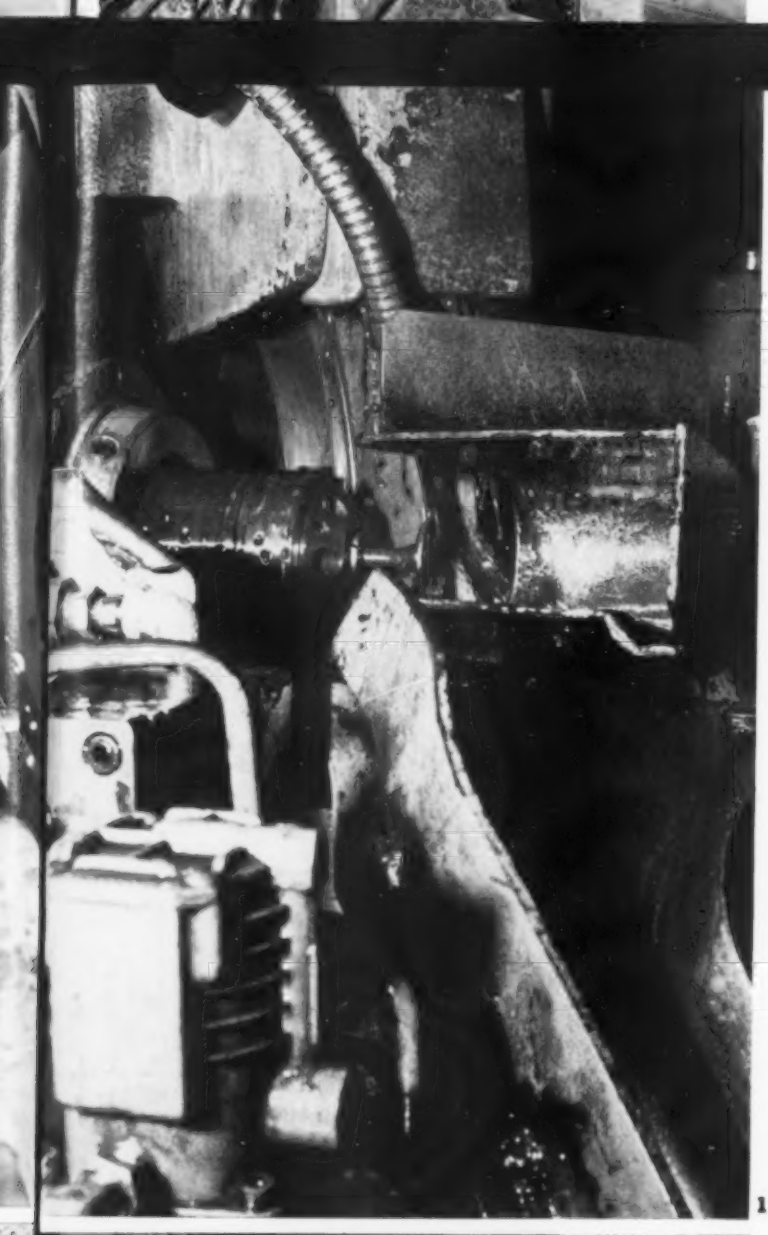


1.

FORD THUNDERBIRD

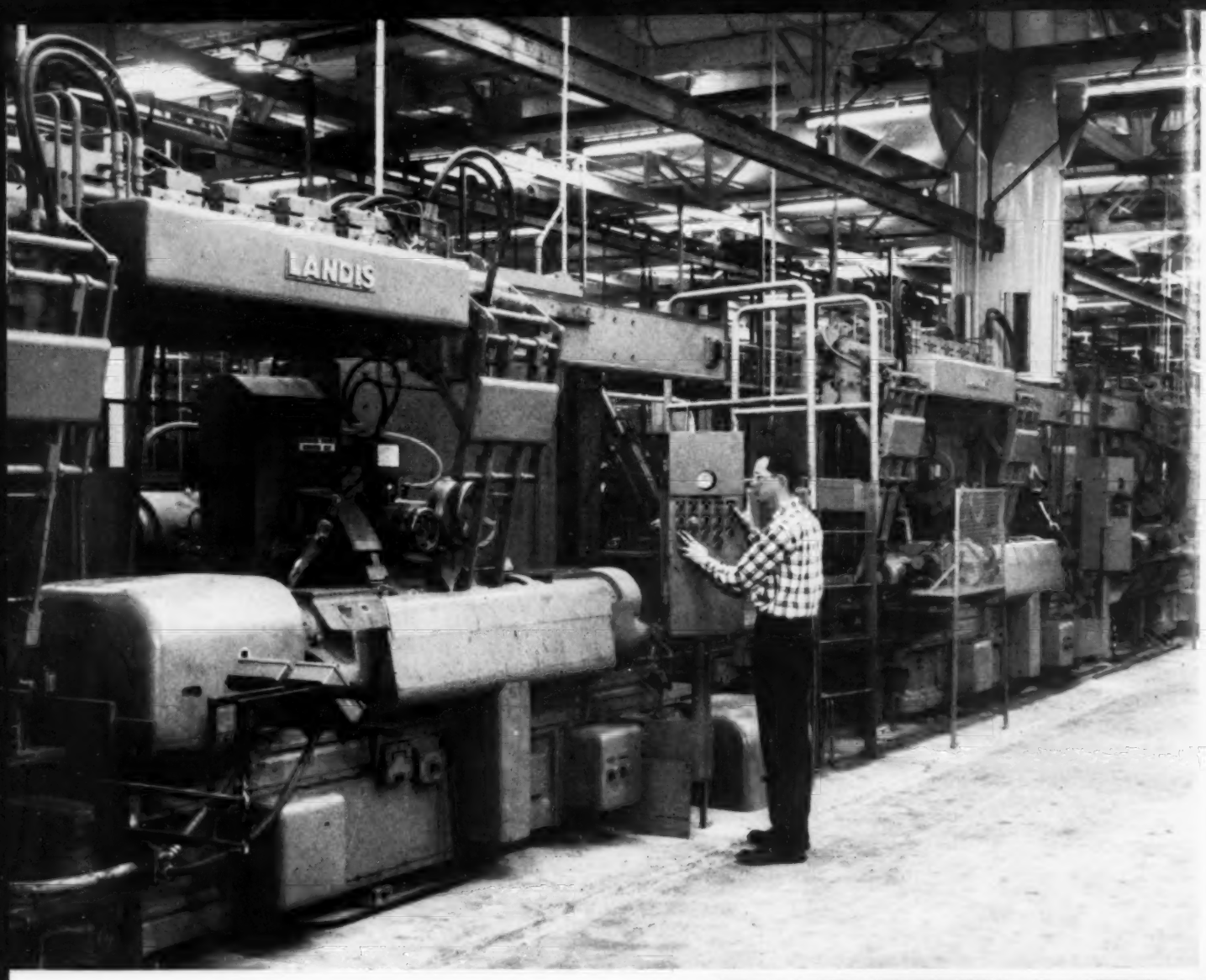
1. Operation: Angular wheel grind rough and finish—45° seat of exhaust valve.
Material: Austentic cast iron.
Tolerance: Within .003" on diameter and runout .0015" T.I.R.
Production capacity: 480 per hour.

2. Operation: Gear honing to remove nicks and burrs from teeth of the pinion gear.
Material: SAE 4620.
Production capacity: 286 parts per hour.

3. Operation: Brushing hub end of impeller assembly converter to remove sharp edges and burrs.
Material: SAE 1137 seamless tubing.
Production capacity: 250 parts per hour.

2.

3.



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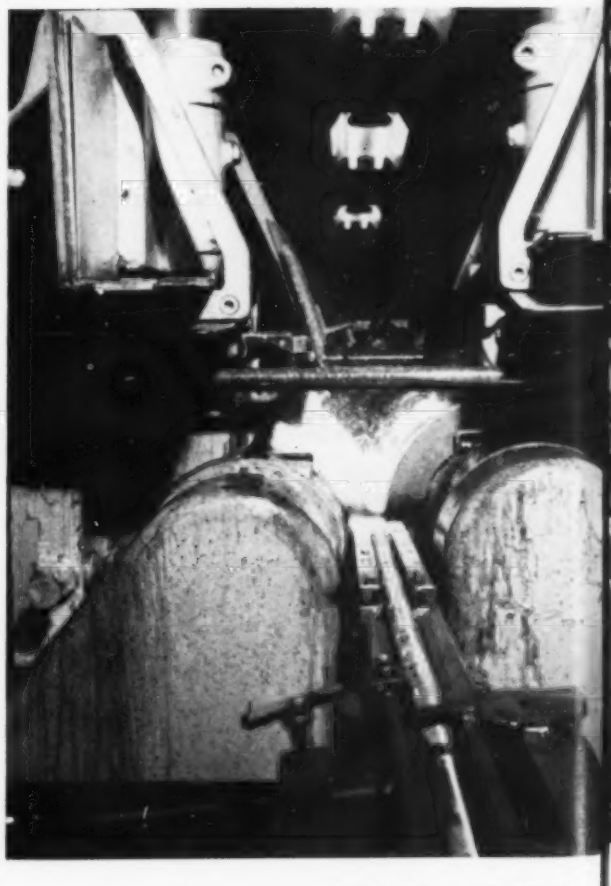


MERCURY COMET

1. Operation: Automatic grinding of pin journals on crankshaft.
Material: Shell molded modular iron.
Tolerance: Within .0008".
Stock removal: Approximately .045".
Production capacity: 40 parts per hour.

2. Operation: Centerless lapping of rocker arm shaft.
Material: SAE 1010.
Tolerance: .0001" end to end.
Stock removal: .0001".
Finish: 12 microinch.

1.

2.

MERCURY MONTEREY

1. Operation: Double disc grinding sides of the gear, flywheel starting ring.
Material: SAE 1046.
Tolerance: Flatness held to .003" T.I.R.
Finish: 50 rms.
Production capacity: 720 parts per hour.

2. Operation: Multiple wheel grinding of main bearings of crankshaft.
Material: Shell molded modular iron.
Tolerance: Within .0008".
Stock removal: Approximately .032".

ABRASIVE GRAINS

"YOU NAME IT

...WE HAVE IT"

SYNTHETIC

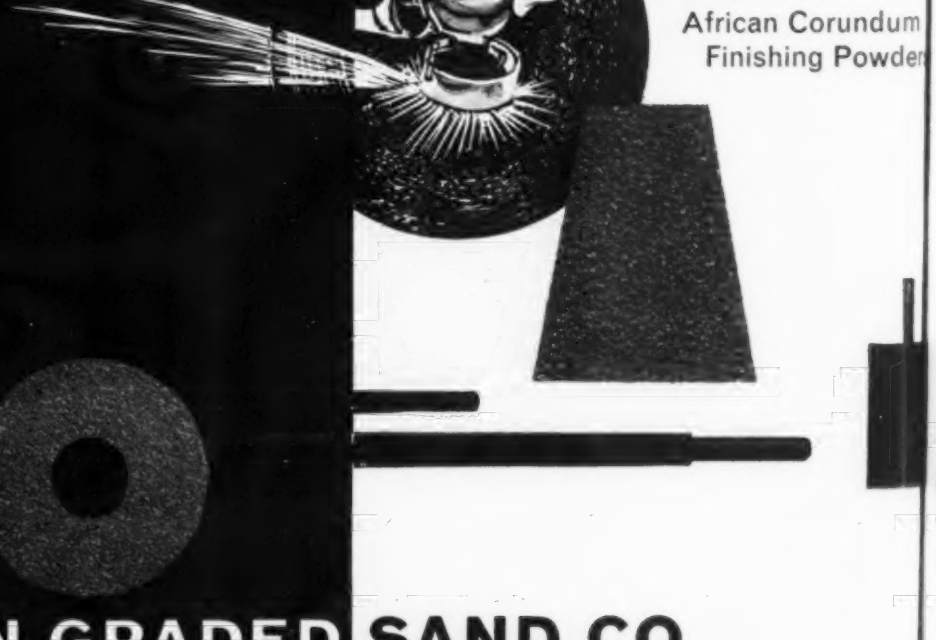
Aluminum Oxide
- *Heavy Duty*
- *Regular*
- *Semi-Friable*
- *White*

Silicon Carbide
- *Heavy Duty*
- *Regular*
- *Green*

Boron Carbide

NATURAL

Flint Quartz
Novaculite
Precision Graded Silica Sand
Italian Pumice
African Corundum
Finishing Powder



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ELECTROLYTIC WHEEL

A DISTINCTIVE PRODUCT HAS BEEN GIVEN A DISTINCTIVE NAME

JET-O-LEC is the new name given to all diamond and non-diamond electrolytic wheels made by this company.

This step has been taken for your protection because all electrolytic wheels are not alike—JET-O-LEC is distinctly different.

It is made by the patented Pressure Cast Bond Process. That's why JET-O-LEC gives better conductivity, faster metal removal and has longer wheel life. Furthermore, every JET-O-LEC wheel is backed by an experience which dates to the early development of electrolytic grinding itself.

Next time try JET-O-LEC. Remember there is a difference. Available in standard and special sizes.

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Capitalize to the hilt on Vibratory finishing with JACKSON VIBRADO

The savings in time and money and the improvement of finishes offered by vibratory finishing of both simple and intricate parts are immense. By all means investigate it. And when you do, be sure you learn all about the JACKSON VIBRADO vibratory finishers . . . the machines which will enable you to capitalize to the very maximum on this method of finishing.

BUILT FOR ULTRA RELIABILITY . . . by the oldest and largest manufacturers of heavy duty vibratory equipment, JACKSON VIBRATORS, INC.

ENGINEERED BY PIONEERS AND ORIGINATORS of some of the best known vibratory finishing equipment.

SOLD AND SERVICED BY NATIONALLY RECOGNIZED EXPERTS IN METAL FINISHING and suppliers of processing media and chemical compounds—ABRADO FINISHING CORP.—whose years of experience is at your service to aid you in achieving the most advantageous processing methods.

FULL WARRANTY—backed by Jackson's long established nationwide Field Service Staff.

Write for the facts that clearly mark VIBRADO Finishing Machines and the expert service behind them as the best means of capitalizing to the *hilt* on the vibratory method of finishing.

SEND US YOUR MOST DIFFICULT SAMPLES and let us demonstrate, entirely without obligation, the remarkable savings in costs and superior finishes that can be obtained with VIBRADO. Accurate data will accompany the return of the sample.

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Models from 1/10 Cu. Ft. to 20 Cu. Ft.

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Grand Rapids 4, Michigan

Some excellent sales territories are still available for qualifying regional distributors

JV-2

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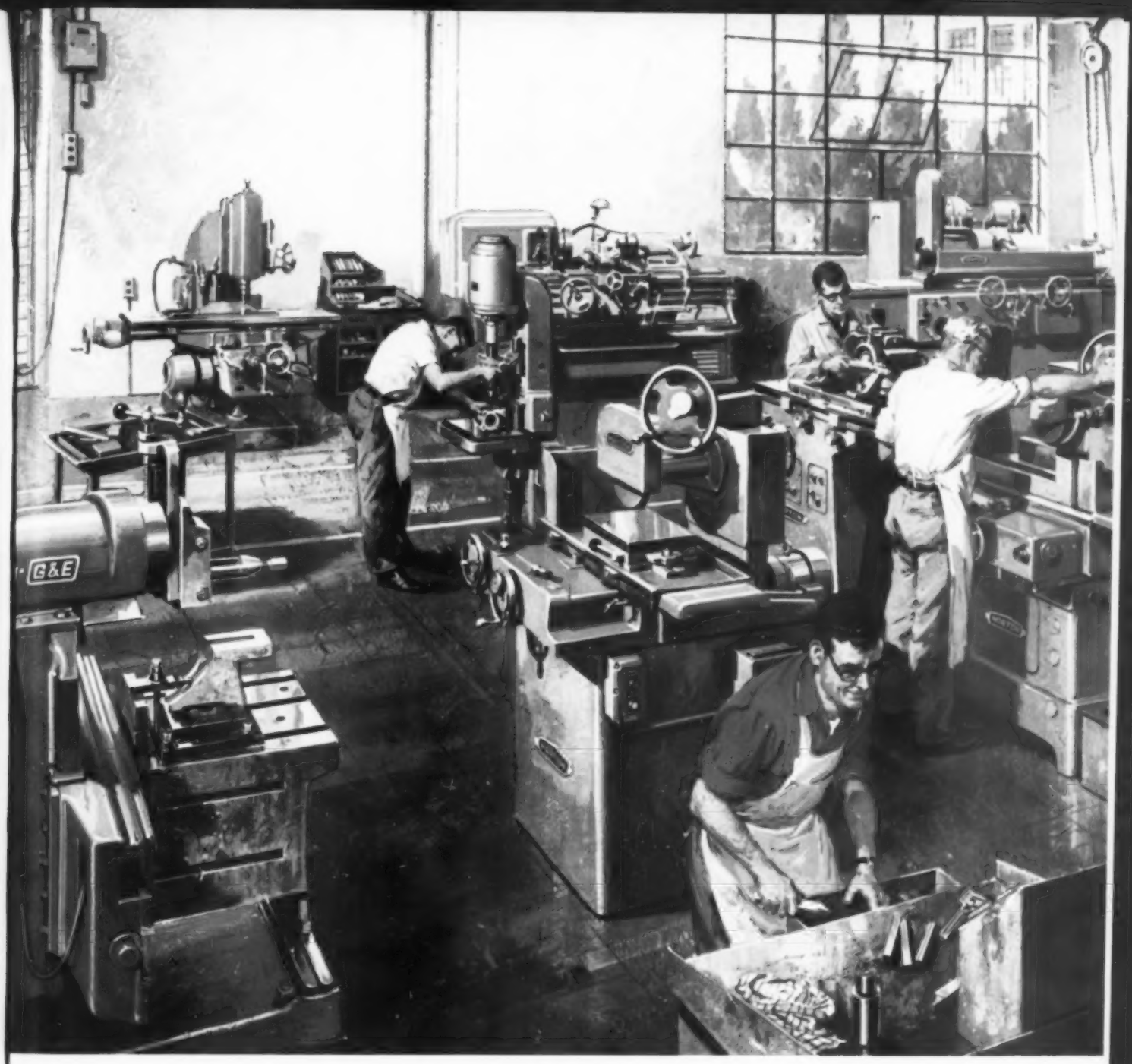

Brightening a tool room with the "Touch of Gold"

Don't let low grade equipment make your tool room a dark spot in your plant operation.

Brighten up with the modernizing, economizing "Touch of Gold" — built into all Norton grinders!

Here you see the five basic types of Norton tool room machines: universal grinders, hand or hydraulic surface grinders, cutter and tool grinders . . . and G & E shapers.

For faster, easier, lower cost grinding, all here include Norton-developed advancements — such as the cutter and tool grinder's tilting wheel head and the hydraulic surface grinder's work table speed of 150 feet per minute.

Your Norton Man will be glad to show you how "Touch of Gold" benefits can be added to your own tool room or production grinding. Or write to NORTON COMPANY, Machine Tool Division, Worcester 6, Mass.

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MACHINE TOOLS

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Non-Slip Floors — BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

Deburring time reduced one-half at AiResearch

The SWECO *Vibro-Energy Finishing Mill* has reduced deburring time 50% at the Garrett Corporation's AiResearch Mfg. Div., Los Angeles. Before installing the SWECO Finishing Mill it took 10 minutes to deburr one part. Now the SWECO Mill does many parts at once. ☒ Originally AiResearch ordered two SWECO Finishing Mills. After checking results, four more were ordered. ☒ AiResearch manufactures precision aircraft, missile and other military equipment where finishing is highly important. SWECO'S Vibro-Energy principle produces a controlled, consistent product, with all surfaces, even edges and recesses, uniformly finished. The open-top design makes it easier to inspect parts without stopping the unit. Cleaning and changing of media have been simplified because unlike other mills which have to be tilted for unloading, the SWECO Finishing Mill practically unloads itself when the plug is pulled. ☒ For full details, application data, and a laboratory test using *your* materials, write SOUTHWESTERN ENGINEERING CO., 4800 Santa Fe Ave., Los Angeles 58, Calif., Dept. 90426.

SWECO

Vibro-Energy finishing mills, separators, grinding mills*

* TM SEC

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Abrasive Engineer's Corner

ARTHUR RAKESTRAW • Contributing Editor

IMPORTANCE OF WHEEL LIFE

• What is the importance of wheel life in evaluating a grinding wheel?—W. F., Geneva, New York.

The chief importance of wheel life is its relationship to rate of production on a given class of work.

Unfortunately, the longest wheel life and the most rapid grinding characteristics cannot be built into the same wheel. Frequent testing is usually necessary to determine the best available abrasive for a particular operation.

If we were to conduct a series of tests, starting with softer grades of wheels, we would find the rate of cut quite satisfactory, but with only a few pieces produced per dressing.

Progressing to the harder grades, we would find the number of pieces produced per dressing would increase, with a corresponding decrease in the rate of cut.

Eventually, we would reach a point of little or no wheel wear, with the rate of cut or production at a similarly low point. Because of the slow rate of cut, labor and overhead would increase out of all proportion.

The limit of wheel life is reached at the point at which the reduction in rate of cut results in increased total cost.

Wheel life is important, but only as it relates to all the factors which combine to establish the total cost of a grinding operation.

THE CORNER is a good place to share your problems, comments, and experience in abrasives and their uses. Send your questions or contributions to: **A. S. Rakestraw, GRINDING and FINISHING**, Wheaton, Ill.

"He comes in here after every safari."

OD GRINDING OF GAGE STOCK

• What suggestions can you give for grinding the OD of stock .030″ and smaller, to be used in making gages? —E. S. R., Cincinnati, Ohio.

If the production of the small-diameter gage material is of sufficient quantity to warrant the purchase of additional equipment, you could well give consideration to one of the smaller types of centerless grinders.

Material such as you have described has been precision ground as a routine application in long lengths and short sections, to diameters as small as .004″, on one such grinder.

Record player needles and very small drills are also handled with ease on these small grinders.

If your production rate does not warrant the purchase of this equipment, it would of course be necessary to locate a job shop with suitable equipment, and farm out the job.

COSTS AND PROBLEMS IN THREAD GRINDING

• Since we are interested in purchasing some equipment for producing threads, we would appreciate your frank opinion about the relative costs and problems involved in thread grinding.—M. A. B., Westfield, New York.

The subject of thread forming is a large one, and the information we have available is not of a character that would be most useful to you in selecting equipment.

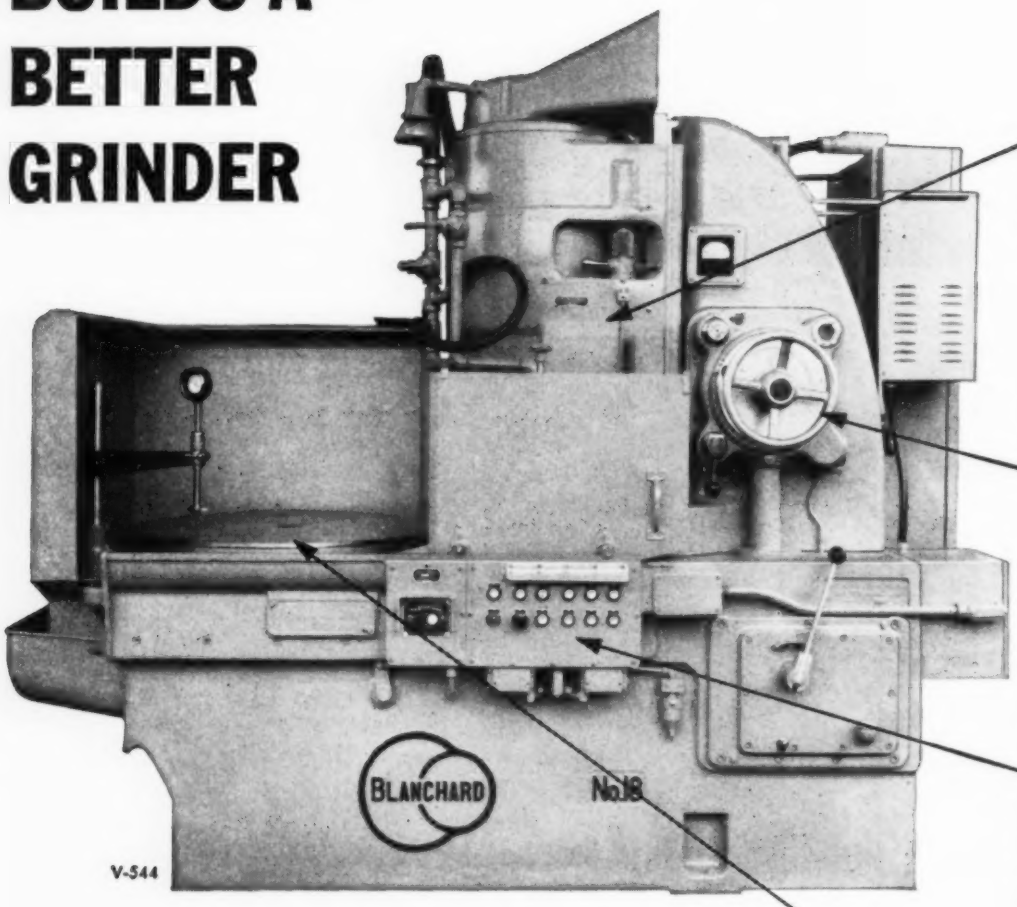
Methods of producing threads are most commonly determined by the thread accuracy required, and to some extent by the strength necessary in the threaded member.

Where extreme accuracy is required, as in thread plug gages, grinding is always preferred. There is some evidence to substantiate the superiority of rolled threads where the utmost in pull strength is needed.

In some instances, the over-all shape of the part might determine the type of equipment needed to produce the threads most economically.

As a suggestion, perhaps it would be a good idea to submit prints of a typical group of threaded parts to manufacturers of thread grinding machines, thread rolling machines, and other types of thread forming equipment, and ask for their recommendations. With these proposals, which would undoubtedly include production rates, your selection of equipment would be simplified. • • •

HOW BLANCHARD BUILDS A BETTER GRINDER



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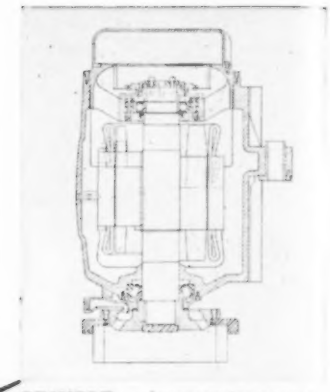
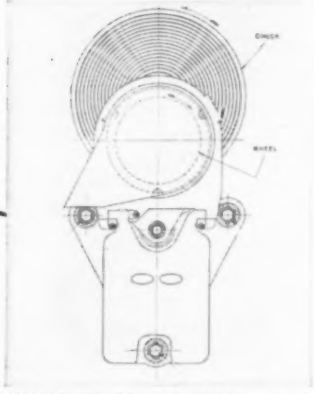
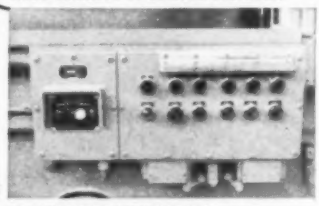


SPINDLE . . . incorporates a superior, pre-loaded anti-friction bearing system that removes all backlash and radial play. Integral "balanced" mounting of rotor on spindle eliminates vibration.

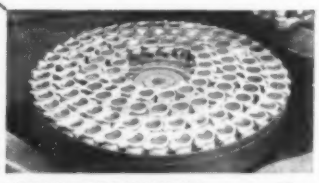


WHEEL HEAD COLUMN . . . is of heavy box-section design for extra rigidity . . . supported at 3 widely-spaced points. Column may be easily adjusted for alignment. Special column tilting devices available to produce concave or convex surfaces.



V-541

GRINDER CONTROL . . . is compact and conveniently located for fatigue-free handling. All control panels are BLANCHARD manufactured for troublefree operation.



W-949

MAGNETIC CHUCK . . . provides maximum useful magnetic surface . . . has such closely spaced poles, that work as small as a quarter will always touch two or more.

There's no mystery about the *better* performance you get with a BLANCHARD Surface Grinder. It's simply a matter of *better* design of each individual machine part. For example, look at just 4 features of the No. 18, shown at the right.

Get complete details on all 24 models of BLANCHARD grinders. They're today's leading high precision, high production grinders on materials ranging from carbon to quartz . . . from bronze to steel. You can handle parts ranging from tiny jewels to giant plates up to 108″ across corners.

PUT IT ON THE BLANCHARD **THE BLANCHARD MACHINE COMPANY**

64 State Street, Cambridge 39, Massachusetts

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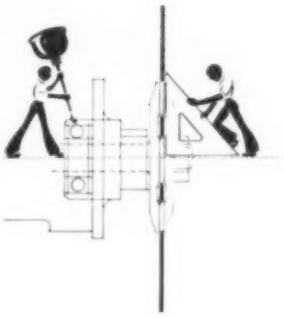
GOOD MACHINE MAINTENANCE PAYS OFF

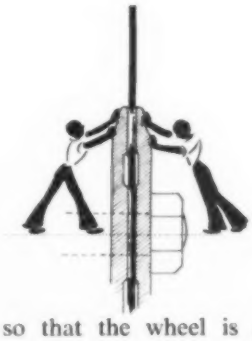
Abrasive cutting machines are machine tools and should be treated with the same care as precision grinders. Proper maintenance of these tools will insure efficient, economical cutting over many years of service. Neglect and abuse will make it impossible for any abrasive wheel to deliver the performance that was built into it.

The one feature common to all machines is the spindle on which the wheel is mounted. Like all machine tool spindles, it is the heart of the machine and must be maintained in good running order. The spindle must run true, its bearings should be in good condition and well lubricated, and the fixed flange against which the wheel is held should be square with



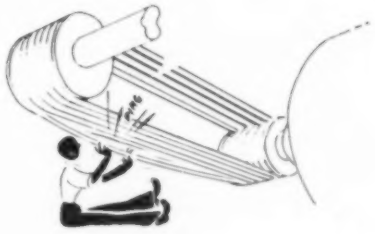
the spindle and free from burrs. Flanges a few thousandths out of true will cause several times that amount of run-out on the wheel faces.

The flanges, both fixed and removable, should be relieved in the



center so that the wheel is gripped by the outer portion of the flanges.

The spindle pulley should be accurately fitted and in good condition. The driving belts should be in good condition, well matched and at proper tension.

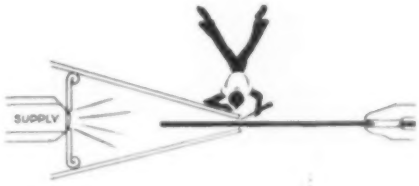


Most machines have some device for rigidly holding the work while the cut is being made. The importance of this feature cannot be overemphasized. If the work is permitted to shift during cutting, accuracy and quality of cut invariably suffer and there is a strong possibility of wheel breakage. For best results, work should be held on both sides of the cut. Holding devices must be kept in good condition and replaced promptly when sufficient wear to cause ineffective holding has occurred.

Wheel guides are extremely valuable for accurate cutting and should be kept at proper settings.

Wet cutting machines function at full efficiency only when the coolant system is well maintained. There are always chips and abrasive particles suspended in any recirculated coolant, so the system should be cleaned regularly. The pump should be checked to be sure it is delivering full volume, and all pipes, valves, and hoses kept free of accumulations of sludge which would retard the flow.

The direction of the flow of coolant onto wheel and work is most important. Machines equipped with "water box" type coolant delivery should have both wings adjusted close to (about 1/16″ from) the wheel. Wings which are badly worn or damaged should be promptly replaced. The exit from the supply line into the water box should be centered on the wheel and the coolant should enter the box in a direction parallel to the plane of the wheel.



Several makes of machines are equipped with flexible hoses or adjustable nozzles. These should be kept adjusted so that the maximum amount of coolant is applied to the cutting area and to both sides of the wheel as it enters the cut.

To do good abrasive cutting, you need a suitable machine with proper maintenance and suitable wheels of good quality.

(Courtesy Allison-Campbell Division, American Chain & Cable Company)

Send **YOUR IDEA** to:
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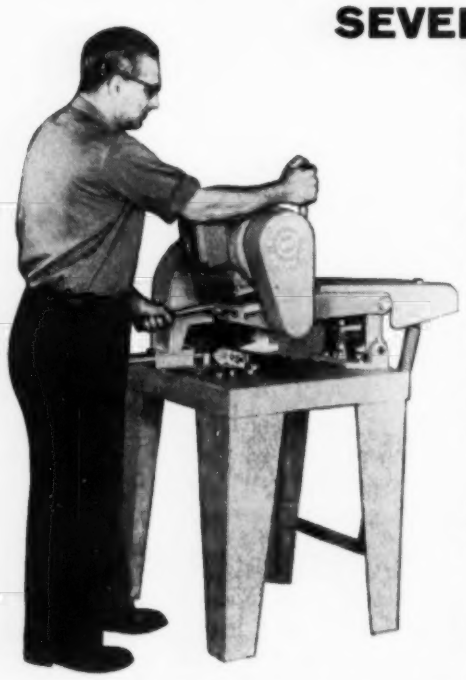
GRINDING & FINISHING
Hitchcock Publishing Company
Wheaton, Illinois
. . . and we'll send you a **TEN-SPOT** for each one we use.

12 seconds per cut on this 2-inch steel bar!

SEVER-ALL MODEL 1-A gives high-quality cuts at low cost



Even the newest super alloys can be cut at 3 to 6 seconds per square inch on the Sever-All Model 1-A dry abrasive cutting machine. The burn-free slices of hardened steel shown above are typical of the cuts you'll get on almost any metal. *You get this speed and quality for an investment of approximately $500!*

You get big capacity, too, with the Model 1-A—up to 2″ square solids, 3½″ O.D. pipe and tubing, 3″ angle iron and 4″ channels. You can cut practically any metal. On top of that, wheel oscillation—an "exclusive" in this price range—provides cooler cutting, longer wheel life.

The Model 1-A is so easy to use, too. Wheel selection is simple—just two types of wheels do *all* your Sever-All cutting jobs. Minimum set-up time required.

You can get immediate delivery from your Sever-All distributor. ***Write*** us for his name — or ask for **Bulletin DH-106** for details on the Sever-All Model 1-A.

SEVER-ALL ABRASIVE CUTTING MACHINES

Allison-Campbell Division • American Chain & Cable Company, Inc.
926 Connecticut Avenue, Bridgeport 2, Conn.

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TRADE MARK

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Literature

Informative reading in abrasive operations for management, engineering, production.

Wheel Guards, Portable Tools

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Six-page product folder lists 34 different types and sizes of portable wheel guards for grinders, sanders and polishers, "industry's most complete line." Several action photos show guards in use. Morrison Products, Inc., 16816 Waterloo Road, Cleveland 10, Ohio.

Abrasive Belt Grinders

Use postpaid card. Circle No. 2

Eight-page, two-color brochure describes in detail the Tri-Matic line of oscillating belt grinders and sheet surfacers. Five sizes—12", 18", 24", 36", and 48"—are included. Sales Service Mfg. Co., 2363 University Avenue, St. Paul 14, Minnesota.

Hand Surface Grinders

Use postpaid card. Circle No. 3

Two new Norton Type TS hand surface grinders, 6" x 12" and 10" x 16", are described. Outstanding features of each machine are described and sketched in this 12-page brochure. Catalog No. 388-1. Norton Company, Worcester 6, Mass.

Vibratory Finishing

Use postpaid card. Circle No. 4

Details and specifications on the entire line of air-cushioned vibratory finishing equipment are outlined in a 12-page bulletin by Pangborn Corporation. Photo shows typical parts before and after. Bulletin No. 1703. Pangborn Corporation, Hagerstown, Maryland.

How To Maintain Clean Coolants

Use postpaid card. Circle No. 5

Several case studies of how leading companies have overcome metal-working production problems caused by dirty coolants. Cases also show the elimination of hidden costs in shorter tool and wheel life, down time for wheel dressing, tool sharpening, and sump tank cleaning. Filtration Division, Hoffman Industries, Inc., Thompson Road, Syracuse 6, New York.

Drill Pointers

Use postpaid card. Circle No. 6

New 12-page bulletin provides technical information on the Oliver of Adrian Model 600 drill pointer and the Model 21 bench drill pointer and the drill point thinner, plus other Oliver machines for wet and dry grinding. Oliver Instrument Company, Adrian, Michigan.

Arbors, Chucks and Gages

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How Hydra-Lock arbors, chucks and gages function, and where and when usage is recommended, are two of the topics of a new six-page bulletin. Text, drawings, and photos show both manual and automatic actuation. Bulletin AC-100. A & C Engineering Co., 12024 East Nine Mile Road, Warren, Michigan.

Man-Made Ruby Wheels

Use postpaid card. Circle No. 8

Vitrified grinding wheels containing man-made rubies as the abrasive and popularly identified as "the ruby wheels" are the subject of this folder. Designated Form ESA-323, it contains grain and grade recommendations, grinding suggestions and supporting data. Simonds Abrasive Company, Tacony & Fraley Streets, Philadelphia 37, Pa.

Mechanical Honing Machines

Use postpaid card. Circle No. 9

Heavy-duty, all-mechanical machines for finishing bores up to 3" in diameter and 3" in length are described in 12-page brochure. Bulletin 200. National Automatic Tool Company, Inc., Richmond, Indiana.

Wet Abrasive Cut-Off Machine

Use postpaid card. Circle No. 10

The Campbell Model 102-A Cutamatic wet abrasive cut-off machine is described and illustrated in this four-page folder in two colors. Specifications and close-ups of the machine are included. Types of workholders are illustrated. Bulletin DH-139. Allison-Campbell Division, American Chain & Cable Company, Inc., 929 Connecticut Ave., Bridgeport 2, Connecticut.

Dial Indicating Groove Gages

Use postpaid card. Circle No. 11

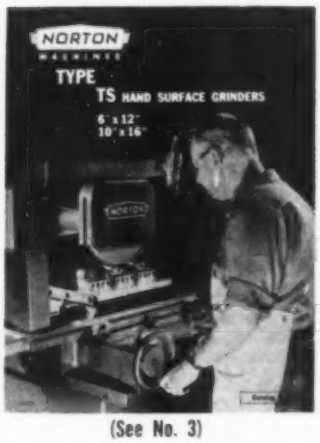
Five complete gage sets for a total range of bore diameters from .157" to 4.883" and three gage sets for snap ring grooves for bore diameters from .240" to 5.270" are featured in this 8-page, 2-color brochure. Catalog 1-A. Boice Gages, Inc., Hyde Park, New York.

Height-Measuring Instruments

Use postpaid card. Circle No. 12

Two-page, two-color flier punched for standard three-ring binder describes Brown & Sharpe's new economy line of height setting, measuring and comparing instruments. Brown & Sharpe Mfg. Co., Industrial Products Division, Providence 1, Rhode Island.

continued



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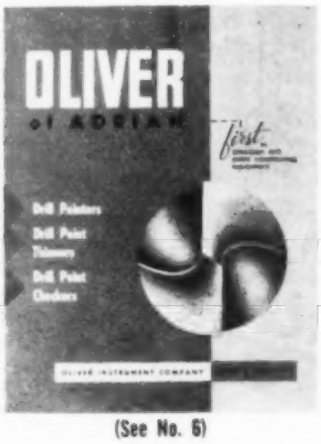

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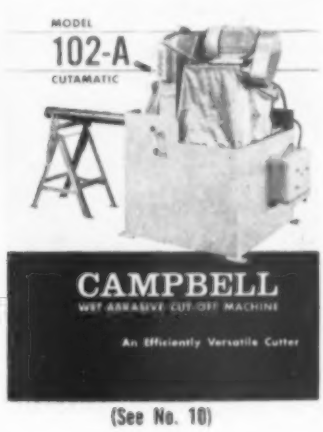

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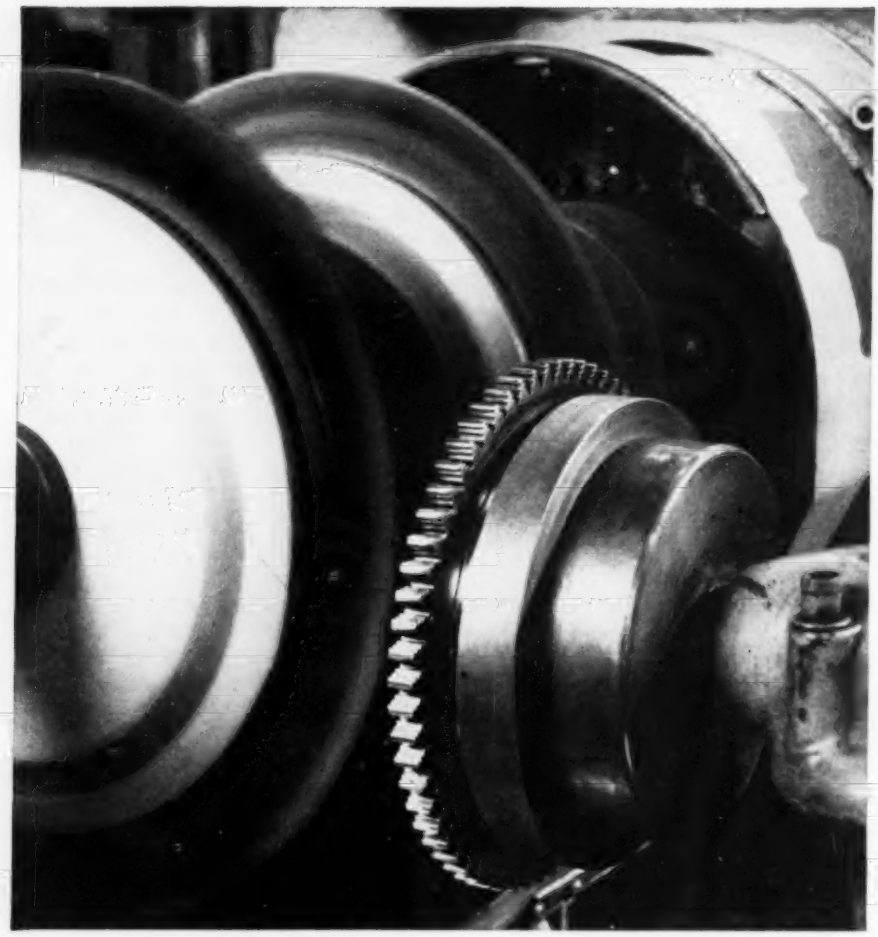


GAS TURBINE DISC DOVETAILS are deburred rapidly, automatically on Osborn 3A Finishing Machine using Osborn 14" Tufmatic® power brushes. Cycle time—floor to floor: 5 minutes . . . *9 times faster than former method.*

COST CUT 90% deburring
with OSBORN power brushing

Before: deburring the 64 dovetails broached on this gas turbine disc was a problem for this major producer of jet engine components. Off-hand filing was slow and costly . . . took 45 minutes per part . . . cost about $5.00 per disc.

Now: an Osborn 3A Finishing Machine—equipped with two Osborn Tufmatic® power brushes—deburrs the part automatically in just 5 minutes . . . *9 times faster.* Finishing cost is down to 50¢ per part . . . *a 90% cost reduction.* And production quality is consistently higher, more uniform.

Osborn power brushes and advanced brushing methods can help *you* same time and money on metal finishing operations of every description —deburring, cleaning, polishing, precision blending. An **O**sborn **B**rushing **A**nalysis—made at no obligation in your plant now—is the first step to savings like these. Write or call *The Osborn Manufacturing Company, Dept. G-13, Cleveland 14, Ohio. Phone ENdicott 1-1900.*

OSBORN

Metal Finishing Machines . . . and Finishing Methods
Power, Paint and Maintenance Brushes • Foundry Production Machinery
Use postpaid card. Circle No. 229

LITERATURE continued

Contract Services
Use postpaid card. Circle No. 13

Six-page brochure shows the range of engineering and production services and the extensive machinery and equipment of the Allen Tool Corporation, Syracuse, New York. Among the services offered are contract machining, jigs and fixtures, dies, and contour machining. Allen Tool Corporation, Box 1382, Syracuse 1, New York.

Mounted Wheels
Use postpaid card. Circle No. 14

Designed for portable and stationary grinders, Dayton Safety mounted wheels and points are a specially developed line of abrasive products for off-hand and precision grinding applications. A six-page bulletin provides complete information. Bulletin 660. Simonds Worden White Company, 1101 Negley Place, Dayton 7, Ohio.

(See No. 14)

Driving Centers
Use postpaid card. Circle No. 15

Catalog describes the PowerGrip line of driving centers, with specifications and illustrations. Chart for ordering is included in four-page folder. Catalogue No. 50961. PowerGrip, Incorporated, Rockfall, Conn.

Adjustable Centers
Use postpaid card. Circle No. 16

Basically a lathe turret catalog, the new Enco brochure contains helpful information on Micro-Set adjustable centers. Catalog 61. Enco Manufacturing Company, 4520-26 West Fullerton Avenue, Chicago 39, Illinois.

Checking, Recording Equipment
Use postpaid card. Circle No. 17

A variety of Annis products, including balancing machines, demagnetizing equipment, strip chart recorders, magnetic comparators, and magnetic equipment, is described in this two-page flier. R. B. Annis Company, 1101 North Delaware Street, Indianapolis 2, Indiana.

Transparent Polymer Film

Use postpaid card. Circle No. 18

"Metalskin," a transparent polymer film protection for polished metal surfaces, is described in a four-page folder and accompanying technical data sheets. Metalskin Corporation, 3 Tenafly Road, Englewood, New Jersey.

Checking and Layout Device

Use postpaid card. Circle No. 19

The Cook Multicheck is a universal layout device capable of checking work from all angles with but one set-up. Two-page flier. Philip Cook & Sons, Inc., 24th and Delaware Sts., Anderson, Indiana.

Surface Finish Measurement

Use postpaid card. Circle No. 20

The complete standard line of Profilometer instrumentation for the measurement and control of surface roughness is detailed in this new 12-page general catalog. Catalog 161. Micrometrical Manufacturing Company, 3621 South State Road, Ann Arbor, Michigan.

(See No. 20)

Wet Blasting Equipment

Use postpaid card. Circle No. 21

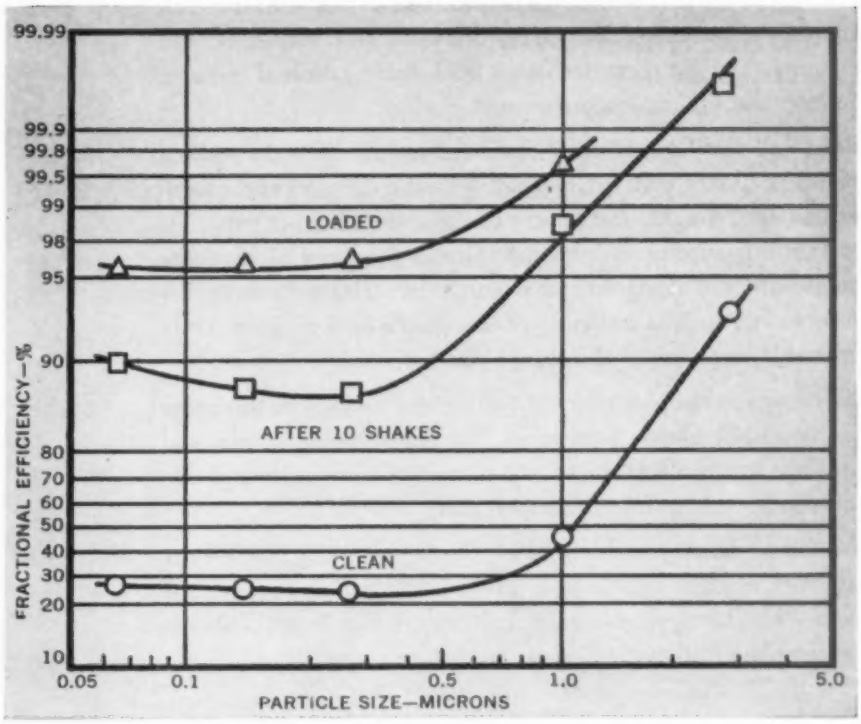
Six-page brochure includes photographs and dimensioned drawings of each of the eight units in the standard Pressure Blast wet blast equipment line, plus explanatory data on the difference between "High Velocity" and "Regular Velocity" wet blast processes. Pressure Blast Mfg. Co., Inc., 27 Pleasant Street, Manchester, Connecticut.

Electric Gaging

Use postpaid card. Circle No. 22

Illustrated 8-page booklet, "Advanced Trends in Electric Gaging," explains the function of Hamilton electric indicator and control units, and describes typical applications of electric gaging to reduce costs of parts fabrication and inspection. Booklet GB-2. Industrial Products Division, Hamilton Watch Company, Lancaster, Pennsylvania.

continued



revolutionary "dust-making machine" proves Torit Dust Collectors have

HIGH FILTERING EFFICIENCY

Because of an increase in critical dust collection problems and rising standards in industrial hygiene, need has arisen for more precise measurements of filtering efficiency. In the past, because of inability to produce uniform-size, sub-micron dust particles, filtering efficiency has been measured by weight. However, recently a homogeneous aerosol generator capable of producing uniform sub-micron particles as fine as .05 microns (1/500,000 inch) and as coarse as 15.0 microns, has been developed by Dr. K. T. Whitby, leading authority on particle technology. (Smoke, fumes, and bacteria fall within this range; most industrial dusts are 2 microns or larger.) Tests using such uniform particles indicate fractional efficiency based on particle count . . . the most exacting filter efficiency tests ever devised.

Under this most demanding of all filter tests, Torit Cloth Filter Dust Collectors performed superbly. Fractional efficiency when loaded with fine dust ranged from 96% at 0.1 micron to 99.99% at 2.5 microns; and after shaking 10 times, from 88% at 0.1 microns to 99.93% at 2.5 microns.

For further information, write for Dr. K. T. Whitby's Technical Report on the "Fractional Efficiency Characteristics of a Torit Unit Type Cloth Collector."

TORIT manufacturing company

1133 Rankin Street, St. Paul 16, Minnesota, Dept. 536

Use postpaid card. Circle No. 230

Now you can settle out large particles from your mineral-type oil or water-soluble coolants—with new efficiency and economy. You get greater mileage from every gallon of coolant, increase tool life, and improve work quality.

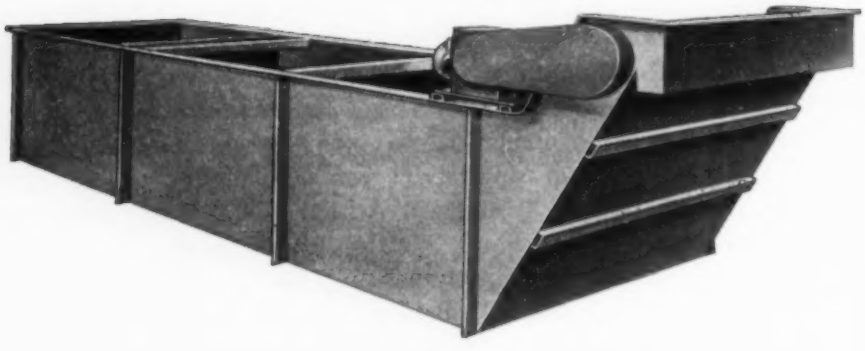
Olson's all-new Conveyorized Settling System makes the settling operation 70-90% efficient, depending on the viscosity of the coolant and size, weight, and nature of the contaminating particles. Operation is automatic from the start to the point of dropping sludge into the sludge disposal container. The system entails no servicing, such as adjusting or changing a filter medium. Only occasional emptying of the sludge pan is required.

The conveyor ramp can be built to extend upward to discharge at any height above floor level. Conveyor flights, chain and sprockets are made extra sturdy to handle the heaviest sludge load conceivable in a settling operation.

The Olson Conveyorized Settling System is available in tank sizes with holding capacities of 250 to 5000 gallons to suit your needs—whether applied to individual machines or central systems. For complete information, mail the coupon today.

ALL NEW

FROM OLSON



CONVEYORIZED

SETTLING SYSTEM

OLSON FILTRATION ENGINEERS *American Laundry Machinery Industries Division of McGraw-Edison Company, Cincinnati 12, Ohio*

OL-16-G

Send complete information on the all-new Olson Conveyorized Settling System.

*Name*_____

*Firm Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

Use postpaid card. Circle No. 231

LITERATURE continued

"Better Grinding"

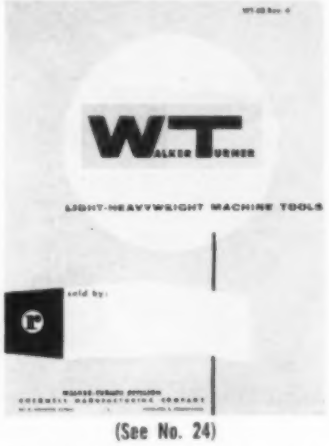
Use postpaid card. Circle No. 23

A 26-minute sound color filmstrip done in cartoon style, "Better Grinding" describes and illustrates the "how to do it" for operators of cylindrical grinders. No charge. Requires an automatic filmstrip projector with 33⅓ rpm turntable for showing. Audio-Visual Department, Landis Tool Company, Waynesboro, Pennsylvania. (Company or organization letterhead)

Light-Heavyweight Machine Tools

Use postpaid card. Circle No. 24

Recently-revised 48-page catalog discusses the complete line of Walker-Turner light-heavyweight machine tools and accessories. Grinders, cut-off machines, belt and disc surfacers are included. Catalog WT-50 Rev. 4. Department 1016, Walker-Turner Division, Rockwell Manu-



(See No. 24)

facturing Company, 400 North Lexington Avenue, Pittsburgh 8, Pa.

Vertical Hydraulic Honing Machines

Use postpaid card. Circle No. 25

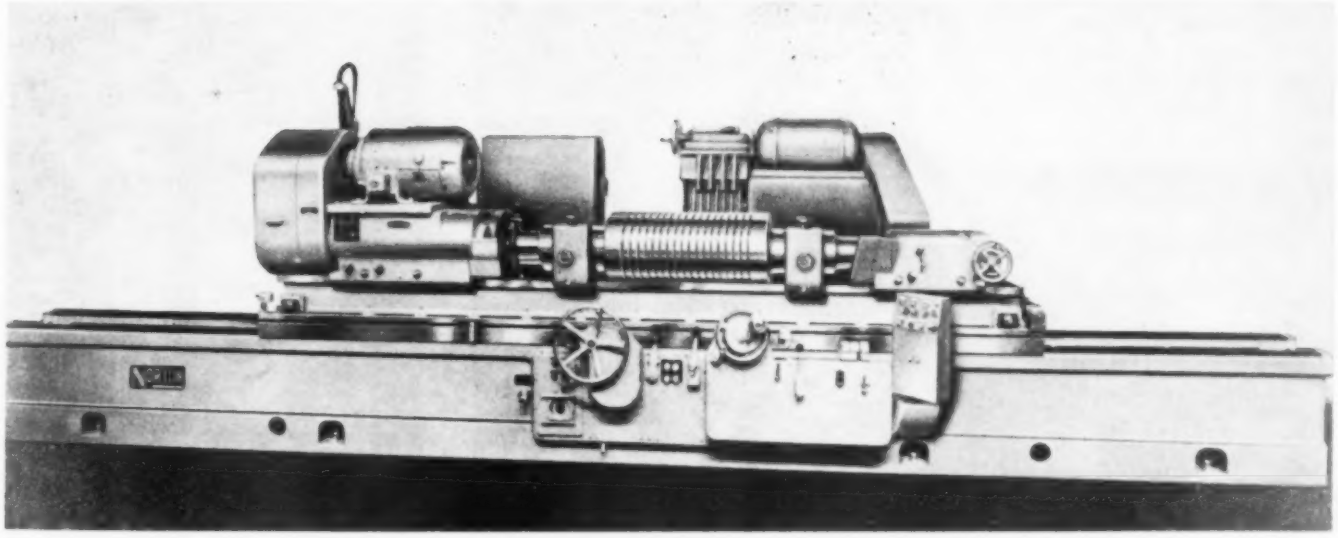
Natco's Bulletin No. 250 is an eight-page, two-color description of their vertical hydraulic honing machines, for efficient all-purpose production honing of engine block, compressor, hydraulic cylinder, and similar bores. Hones bore up to 7½" in diameter, with 24" maximum stroke. National Tool Company, Inc., Richmond, Ind.

Portable Vibration Analyzer

Use postpaid card. Circle No. 26

Four-page folder describes the application of the IRD Model 314 vibration analyzer, a low-cost precision instrument designed for the measurement of vibration and for dynamic balancing of rotating equipment. International Research and Development Corporation, 6150 Huntley Road, Worthington (Columbus), Ohio.

FORM GRINDER HANDLES ROD MILL ROLLS TO 18″ x 96″ IN QUARTER OF TURNING TIME



A new rod mill roll form grinder developed by Norton Company's Machine Division grinds the desired shape on rod mill rolls in 20-25% of the time required for turning, and can also serve as a heavy-duty plain cylindrical grinder for conventional work.

Rolls of materials too hard to turn on a lathe can be abrasive machined to form the original shape, and readily reground after a period of service.

A crush truing device is mounted on the wheel slide at the back of the wheel. It uses the principle of back-up rolls to support the crushing roll during the crushing operation. This eliminates the need for large diameter, expensive crushing rolls.

This machine will handle rolls up to 18″ in diameter and 96″ in length. It mounts wheels up to 30″ in diameter and up to 12″ wide. In many cases, this will permit machining several forms in the roll simultaneously. The grinding wheel will operate at 10,000 surface feet per minute to achieve rapid stock removal. At this speed, it is important for the wheel to be in perfect balance. An automatic wheel balancing arrangement is included so the operator can dynamically balance the wheel on the machine in seconds by merely pushing a button.

The wheel feed mechanism is designed to plunge grind up to 1″ in depth on the radius of the work (or 2″ on the diameter). Hydraulic table traverse is provided for traverse grinding on conventional work or to position the table under power.

Although many features of the rod mill roll form grinder are new, it contains standard mechanisms which have been used successfully in other Norton grinding machines.

Norton Company, Machine Tool Division, Worcester 6, Massachusetts.

Use postpaid card. Circle No. 31

TEST INDICATORS HAVE LESS TENSION, FRICTION

A new series of test indicators, from Federal Products, have 40% less gaging tension and 25% less friction. These new super-sensitive Testmasters include both large (1½″ diameter) and regular (1″ diameter) dial models.

Inherent accuracy and sensitivity of this series permits the inclusion of a model graduated in 50 millionths of an inch.

The improvement is achieved primarily by a more responsive internal mechanism, plus a new counterbalanced indicating hand and full-jeweled bearings throughout.

Mounting dovetails are cast integrally with the case to prevent any chance of their loosening during use.

The new series is an addition to Federal's standard M series.

Federal Products Corporation, Providence 1, Rhode Island.

Use postpaid card. Circle No. 32

ADDITIVES EXTEND LIFE OF LAPPING COMPOUNDS

A new additive, "Granulaide," has been developed by Wheel Trueing Tool Co. to extend the life of its Trulap lapping compound.

continued

The new material evenly disperses small particles of diamond dust throughout the compound and maintains a high degree of activity among the surface particles. This keeps the compound from drying or draining away, yet eases the cleaning phases of the lapping operation.

The diamond particles are uniform, blocky shapes for an even cutting-polishing action. There are no "spears" or "blades" to scratch the work, nor useless, undersized particles.

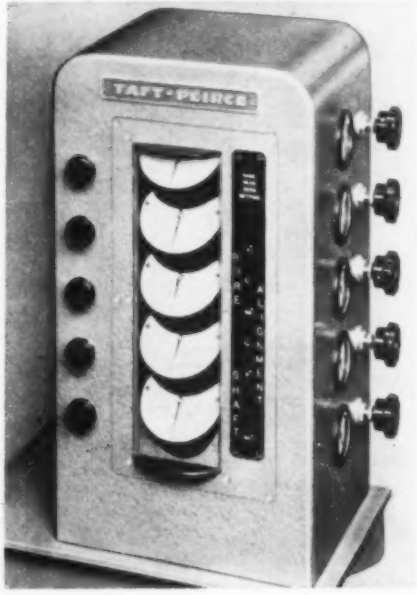
Lubex, a second new product, likewise extends the reformulated Trulap, claimed to be fast working, economical in application, easy to store and to remove from finished surfaces. The compound is laboratory produced from diamond powder graded to U.S. Bureau of Standards specifications.

Available in a micron range of 0-½ to 200 and mesh equivalent of 60,000 to 100, the improved Trulap is color coded to prevent misapplication of any of the wide range of diamond abrasive sizes and concentrations.

Wheel Trueing Tool Co., 3200 W. Davison, Detroit 38, Michigan.

Use postpaid card. Circle No. 33

SPACE-SAVING IS KEY IN NEW AIR GAGE DESIGN



Air gage equipment on which readings from five different points are shown on dials in a cabinet only 10¼" wide has recently been developed. Width of the instrument is 25% less than any previous models, and is narrower than the space required for any other form of air gage indicator. The cabinet is only 9" deep and 18½" high.

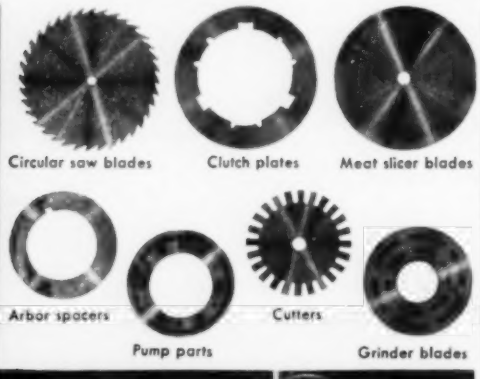
The design allows the building of multi-unit gages which will be smaller than any comparable device whenever five or more indicators are necessary. Reduction in size has been made possible by the patented Taft-Peirce method of stacking air gage dials, plus compression of other elements of the gage into smaller areas. The amount of space saving increases as more dials are used.

Compactness of dials is achieved by mounting them at a 45° angle to the cabinet panel, in vertical rows as opposed to the horizontal rows used with most multi-dial units. The arrangement permits full visibility of the entire sweep of the indicator. In fact, reading is usually easier than when the dials are perpendicular. All readings can be checked at a glance.

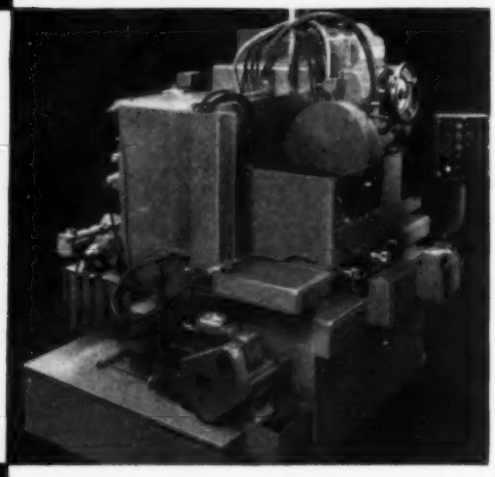
Taft-Peirce Manufacturing Company, Woonsocket, Rhode Island.

Use postpaid card. Circle No. 34

For superior FLATNESS, PARALLELISM, and FINISH on parts like these...



...this is the machine for you to buy!



Here are some of the reasons why... ⟶

MODEL E ROTARY SURFACE GRINDER

- Rugged column and long ways permit both heavy stock removal and fine finishes.
- Tiltable table for concave or convex grinding.
- Concentric line grinding pattern.
- Ruff and fine wheel feeds permit both operations on same machine.
- Compensation for wheel wear or wheel dressing doesn't disturb feed setup.
- Sundstrand magnetic chuck is standard equipment.
- Pushbutton automatic grinding cycle.

Send for Bulletin No. A-377

SUNDSTRAND ARTER

SUNDSTRAND MACHINE TOOL

BELVIDERE, ILLINOIS • Division of Sundstrand Corporation

Use postpaid card. Circle No. 232

PORTABLE BLASTER SHOWS LOW AIR, ABRASIVE USE

Rugged and lightweight, with low air and abrasive consumption; the Little Sputz blaster can be carried and operated by one man alone, even in the most inaccessible places, for spot repairs to coated surfaces and for other small jobs.

The Little Sputz blaster has several special features. It can be pulled along on its own wheels or carried by hand. All control-gear swings beneath into a protected position and the machine will roll away by itself if struck accidentally. The special metering valve permits the use of ultra-fine abrasive for etching or woodwork and is adjustable for standard abrasives. Inexpensive automatic controls are also available.

Andersen Manufacturing Co., 6826 Lynford St., Philadelphia 49, Pa.

Use postpaid card. Circle No. 35

NEW HAND GRINDER MORE POWERFUL, RUNS COOLER

A new industrially rated hand grinder, Model No. 3 (Dremel Mfg. Co.) is said to have a 50% increase in power over its predecessor Model No. 2, and to run much cooler.

The unit develops 27,000 rpm and sustains its high torque under load. It was designed to cover a wide

continued

for a superior finish
when centerless grinding
specify Jewel Brand
abrasive belts

Courtesy of Production Machine Company, Greenfield, Massachusetts

The 486 Centerless Grinder is designed for precison grinding and finishing small parts by plunge cut or thru-feed methods. It is equipped with a ground steel contact roll or a rubber faced contact roll for low micro-inch finishing.

No matter what the grinding method or the operation to be performed, there's a Jewel Brand abrasive belt designed for it. That's why experienced operators specify Jewel Brand. They know they'll get the right bond, the right backing and the right grain.
Next time, why don't you specify Jewel Brand?

For a trial run, call your industrial distributor or write: Abrasive Products, Inc., South Braintree 85, Mass.

JEWEL BRAND

COATED ABRASIVES

belts • rolls • sheets • discs • specialties

Use postpaid card. Circle No. 233

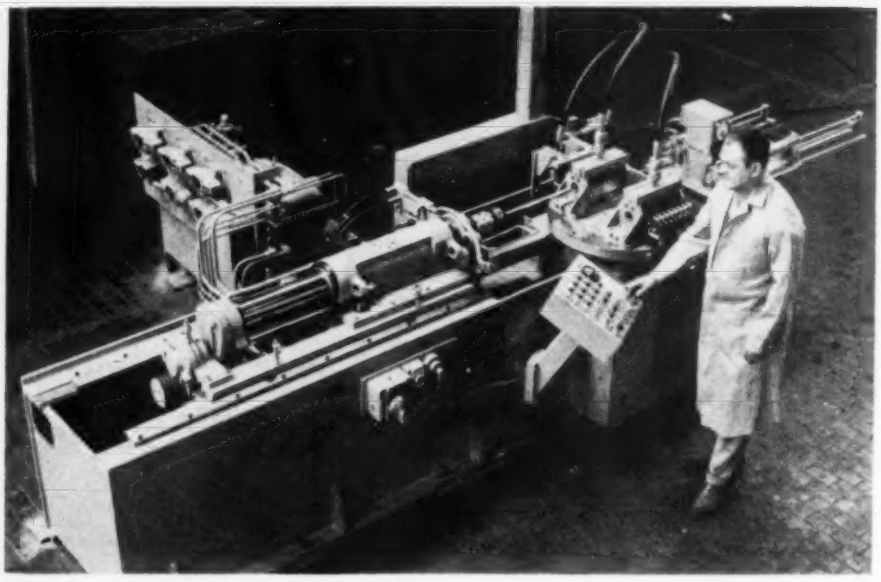
range of industrial applications including polishing and grinding dies and molds, model shop work, production deburring, and general tool and die room use.

The motor is housed in shockproof bakelite and is equipped with a 3-wire ground cord for maximum safety. With a collet capacity of 1/16", 3/32", and 1/8", it accommodates all standard wheels and burrs. Its lightweight of only 18 oz. gives the operator highly sensitive control on close tolerance work.

Dremel Mfg. Co., Racine, Wis.

Use postpaid card. Circle No. 36

NEW HORIZONTAL STACK-MICROHONING MACHINE GIVES LONGER TOOL LIFE, REDUCES TIME



Greater accuracy, longer tool life and reduced cycle time are featured in new, improved horizontal stack-Microhoning machines developed by Micromatic Hone Corporation.

A technique recently developed by Micromatic, horizontal stack-Microhoning, is used for finishing parts such as connecting rods and gears, where the bore length is comparatively short with respect to bore diameter. The parts are stacked horizontally and Microhoned as "one long part."

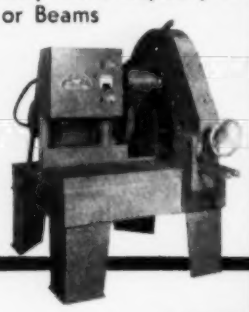
Advantages of this method, compared to former set-ups on 4- or 6-spindle vertical machines, include higher production rates, greater machine simplicity and reliability since only one spindle is used, and greater abrasive economy through the use of longer stones.

Micromatic's new machines, designated Model 5HXH-16, have a shorter, more rigid base which contributes to greater accuracy. The shorter base and a shorter tool put the work closer to the quill, thus making the tool more rigid. This minimizes the effect of tool sag and assures a straighter hole. Accuracy also is improved by the addition of a tool adapter to minimize runout.

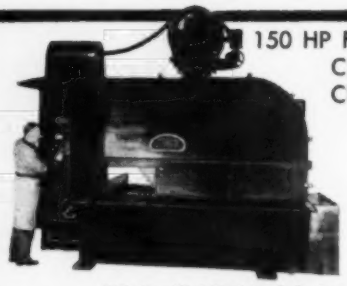
An automatic hydraulic probe prechecks for proper clearance in the bored holes. The probe is a safety feature that eliminates tool breakage and stone shear caused by improperly processed bores of parts that come to the Microhoning operation. Another new feature is an

Ty-Sa-Man America's Most Complete Line of Industrial Sawing Machinery

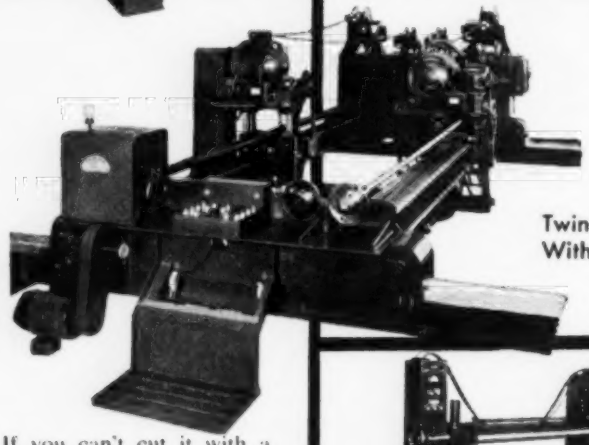
30 HP Chop Saw, Capacity 8" Rounds or Beams



150 HP Friction Saw Capacity 24" Channel

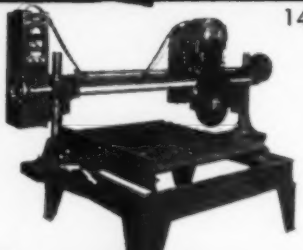


75 & 40 HP Model Available



Twin 40 HP Gantry With 90° Heads

144 DB Saw for Plate



15 HP

If you can't cut it with a standard saw . . . call us! Ty-Sa-Man has built thousands of special and standard saws, one of which may solve your problem. If not, our engineering staff is at your disposal.

TY-SA-MAN Machine Co., Inc.
1016 White Ave.
Knoxville, Tenn.

Write Today for Free Brochure

A brochure pictures and describes the functions of many metal saws. If you have a cutting problem, write or call today.

Use postpaid card. Circle No. 234

integral shot-bolt locator for positive positioning of the indexing fixture.

An improvement in the coolant system, including larger distribution lines, assures maximum coolant flow to facilitate removal of swarf from the work area. Another change has been the repositioning of the operator control panel for greater convenience and accessibility when changing tools.

Collectively, the improvements have also made possible a three-fold increase in stone life, and a reduction in cycle time.

The wrist pin bores in eight connecting rods are finished at one time on the horizontal stack-Microhoning machine illustrated. An average of 0.0025" of stock is removed from each rod to generate the final size in the .926" diameter X 1.032" long bore. The diameter tolerance is held to 0.0003", and straightness and roundness are held to 0.0002". Surface finish is controlled to specifications. Estimated gross production is 640 parts per hour.

Micromatic Hone Corporation, 8100 Schoolcraft Ave., Detroit 38, Michigan.

Use postpaid card. Circle No. 37

MULTI-PURPOSE OPTICAL TOOL

In effect a 360-sided optical polygon, the Milichex Model MOX-3600 is a multi-purpose tool for checking alignment and angular spacing in any multiple of full degrees. When used with an autocollimator or similar optical sighting device, the optical polygon provides a mirror surface which reflects the projected image of the sighting devices crossed hairs.

continued

clear the air for production

Dust produced by grinding, chipping and similar operations is removed as created by down draft dust control systems, pioneered by Kirk & Blum.

Whatever your problem in industrial dust control, call on Kirk & Blum, an organization of engineers and mechanics with 50 years' experience in this specialized field.

Write for complete information.
The Kirk & Blum Manufacturing Co.,
3124 Forrer Street, Cincinnati 9, Ohio

KIRK & BLUM

DOWN DRAFT DUST CONTROL

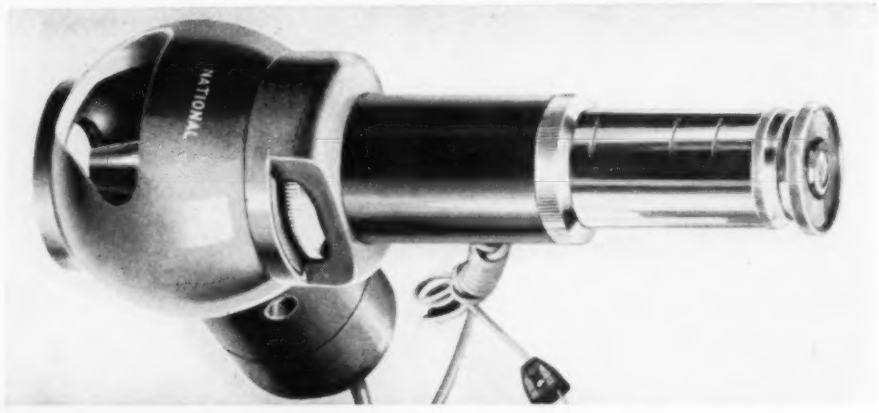
Use postpaid card. Circle No. 235

The amount of deviation between the reflected image and the graduated cross hairs in the sighting device gives a geometric check on misalignment, parallelism, angularity, etc. It replaces conventional polygons divisible into 360°.

Michigan Tool Co., 7171 E. McNichols, Detroit 12, Michigan.

Use postpaid card. Circle No. 38

ILLUMINATED MEASURING MICROSCOPE



The National illuminated measuring microscope is a pocket-sized, portable measuring instrument designed for on-the-spot inspection in the laboratory, shop, or field.

It features zoom-type magnification, continuously variable from 27X to 40X, 55X to 80X, or 82X to 120X, and measuring scales that read directly from .002", .001", .0005", .02 mm, .01 mm, or .005 mm.

The magnification range and measuring scale desired can be selected by interchanging eyepieces.

The instrument is self illuminated and is provided with an integral flashlight illuminator and a transformer that plugs into 110V, AC outlets.

It will measure wear on punches and dies, diameters of small holes, impressions in Brinell tests, pitch and wire diameter of small springs, detect cracks and flaws in hardened steel, and examine moving parts for wear.

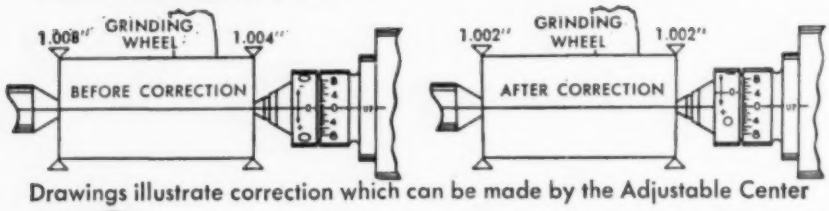
National Instrument Co., Inc., Baltimore 15, Maryland.

Use postpaid card. Circle No. 39

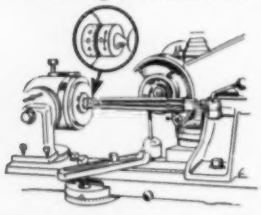
NEW ... fast, easy CENTER ALIGNMENT for GRINDERS

Center being used on grinder

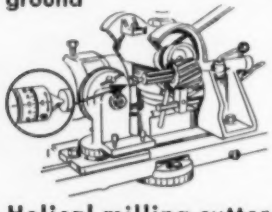
The Enco Micro-Set® Adjustable Center



Drawings illustrate correction which can be made by the Adjustable Center



Taper reamer being ground



Helical milling cutter being reground

- Permits TRUE work alignment from tailstock or headstock on: cylindrical grinders, cutter grinders, gear shavers, lathes and tracer attachments.
- Saves one half the setup time.
- Ends hit or miss table adjustments to obtain precise alignment.
- An inexperienced operator can get a precise alignment—easily—in seconds.
- Quickly pays for itself in time and scrap savings.

MORSE TAPER
No. 2—$49.50, No. 3—$61.50, No. 4—$76.00.

BROWN & SHARPE
No. 6, 7—$53.00, No. 8, 9—$65.00, No. 10, 11—$85.00.

JARNO
No. 6, 7—$53.00, No. 8, 9—$65.00, No. 10, 11, 12—$85.00.

STRAIGHT SHANK
¾"—$56.00, 1"—$68.00, 1¼", 1½"—$80.00.

We also manufacture Precision Lathe Turrets and Tiny-Titan Magnet Base Holders.

Enco MANUFACTURING CO. Dept. 8111 4520 W. Fullerton Ave., Chicago 30, Ill.

Write for catalog and nearest distributor

Use postpaid card. Circle No. 236

WET BLAST MEDIA DEVELOPED

Hydrabrasive media in straight or inhibited form has been developed for all wet blast applications. Inhibited types include dispersion-aiding and oxidation-retarding agents.

Media are accurately graded and available from coarse to micron-flour sizes in most materials— aluminum oxide, beads, Novaculite, various ores, natural and manufactured grain, grit, and shot.

Automation Services, Inc., Hydra-Blast Manufacturing Division, P.O. Box 5554, Fenkell Station, Detroit 38, Michigan.

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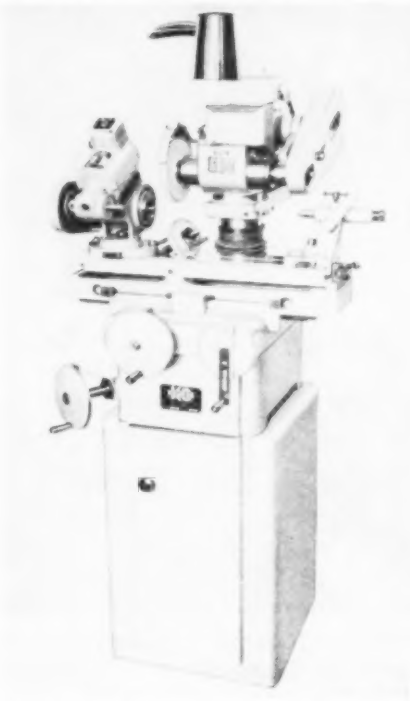
INTRODUCE "COMPACT" TOOL AND CUTTER GRINDER



The K. O. Lee B300 series of tool and cutter grinders is a compact version of the company's established BA900 series. The B300 will accomplish the same set-ups, within its range, as can be done on the larger series of grinders. Fixtures and accessories are interchangeable.

Condensed specifications include: Swing over table 8¼" (with 1" raising blocks, 10¼"). Distance between centers of tail stocks 17½". Table dimensions: Working surface 3⅝" x 22½", sub-table 6⅜" x 26¼". Table calibrations on left end, calibrated in taper-per-foot 3" either side of center, in degrees 15° either side of center. Table calibrations at center 360°. Table traverse 10". Fast feed (direct drive), 2¾" per revolution of crank; slow feed (3:1 ratio) 15/16" per revolution of crank. Table T-slot 7/16". Cross feed 5" —.100" per revolution of hand wheel, Acme type thread, calibrated in thousandths.

All shafts ball-bearing mounted. Saddle ways have automatic compensation for wear. Wheel head swivels full 360°, calibrated in degrees. Minimum distance centerline of wheel shaft to top of table 3¾". Maximum distance centerline of wheel shaft to top of table 10¾". Distance from floor to center of head stock 47". Maximum height of machine with column extended 57". Vertical movement of column 6¾" —.040" per revolution of hand wheel, graduated in thousandths. Grinding wheels: Maximum size 6" diameter, wheel bore ⅝" diameter. Cabinet stand base dimensions 17" x 17".

Examples of the fixtures adaptable to the B300 series grinders are: motor driven work heads, tap grinding fixtures, sensitive work heads, diamond dressers, and cutter and hob grinding arbors.

K. O. Lee Company, Congress at First, Aberdeen, South Dakota.

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VERSATILE HAND CHUCK WRENCHES FIT ALL CHUCKS

Only two sizes of spinner wrenches (handle and assembled body) are required to attach the proper socket to fit all chucks, regardless of make, in a new line of Powergrip hand chuck wrenches.

These sockets are quickly assembled or removed, as they are held in place by a spring ball.

Powergrip, Incorporated, Rockfall, Connecticut.

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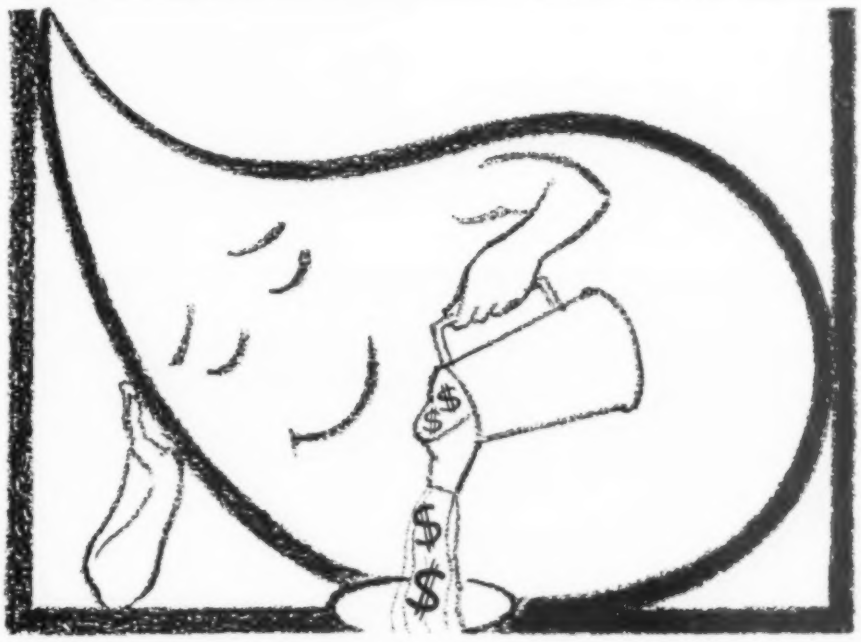
continued



Is a lazy coolant pouring your profits down the drain?

Do you have to change your grinding coolant too frequently? Does it become rancid quickly — fail to keep the wheel open or settle chips properly?

Are you getting poorer finishes, lower stock removal and less wheel life than you think you should?

If so, switch to White & Bagley *lively* coolants. There's not a tired ounce in a tankful!

For about 1¢ a gallon coolant cost, use W&B Chemical Concentrate 1500 for grinding steel. W&B E-55 is recommended for steel, cast iron and nonferrous metals. Both concentrates give extremely keen grinding action.

For grinding AND cutting, use W&B Lubricant 1888 — a high detergent, oil-type, water soluble concentrate for better finishes.

For very tough grinding and cutting jobs, W&B HD Soluble Oil 2213 (heavy duty) provides extra lubricity, exceptional support for the cutting tool or grinding wheel.

For critical thread, gear, tap and form grinding, W&B Grinding Oil 1572 is the standard of the industry.

W-B INDUSTRIAL LUBRICANTS

Write for facts about cost-saving coolants to: The White & Bagley Co., 88 Foster St., Worcester, Mass.

THE WHITE & BAGLEY CO.

Worcester, Massachusetts · Detroit, Michigan

Originators of Grinding Lubricants

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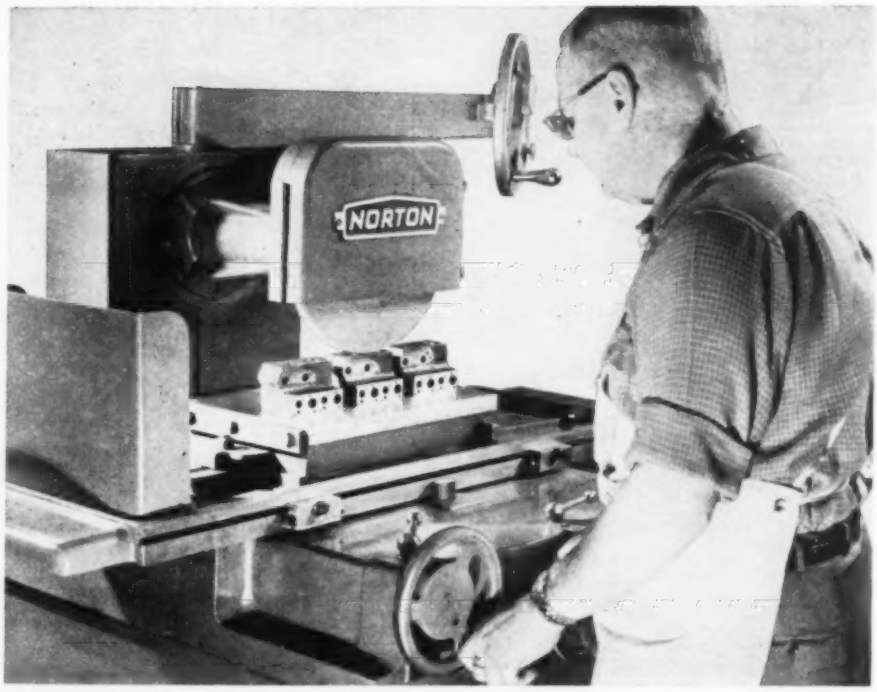
HAND SURFACE GRINDERS AVAILABLE IN TWO SIZES

The Norton TS hand surface grinder is now being built for immediate delivery in two sizes, 6" x 12" and 10" x 16". A prototype of these machines was shown at the 1960 Machine Tool Exposition.

These hand surface grinders were designed to meet the needs of toolrooms, die makers, school shops, repair shops, etc. for a precision grinder at low cost.

The Norton hand surface grinder is made with the ruggedness and built-in precision features which are typical of the standard Norton hydraulically powered surface grinders.



Ease of hand operation was a primary consideration in designing this first Norton hand surface grinder. Antifriction bearings under the table take the effort out of hand traversing. An adjustable friction brake provides additional "drag" if desired.

The table traverse hand wheel can be mounted on either side of the table (perhaps you have a left-handed operator) and may be readily adjusted to position the handle for convenient short stroke operation.

The two-speed downfeed hand wheel has graduations of .0005" for fast, accurate positioning, plus a finer control with a vernier which reads to .0001". For fine feeding or finishing passes, there is a micrometer feed mechanism with reduction gearing that permits feeding in increments of .0001". The 10" x 16" model has cross feed increments as small as .0005". The 6" x 12" model has cross feed graduations in increments of .001". An adjustable friction brake also provides "drag" on the crossfeed.

Work height capacity under a full-sized grinding wheel is 12" on both models. Rigid and long vertical slides insure accuracy throughout the full height range of workpieces. The saddle has a guide rail design, originally developed for the Norton hydraulic surface grinders, to give accurate crossfeeding throughout the life of the machine.

Norton Company, Machine Division, Worcester 6, Massachusetts.

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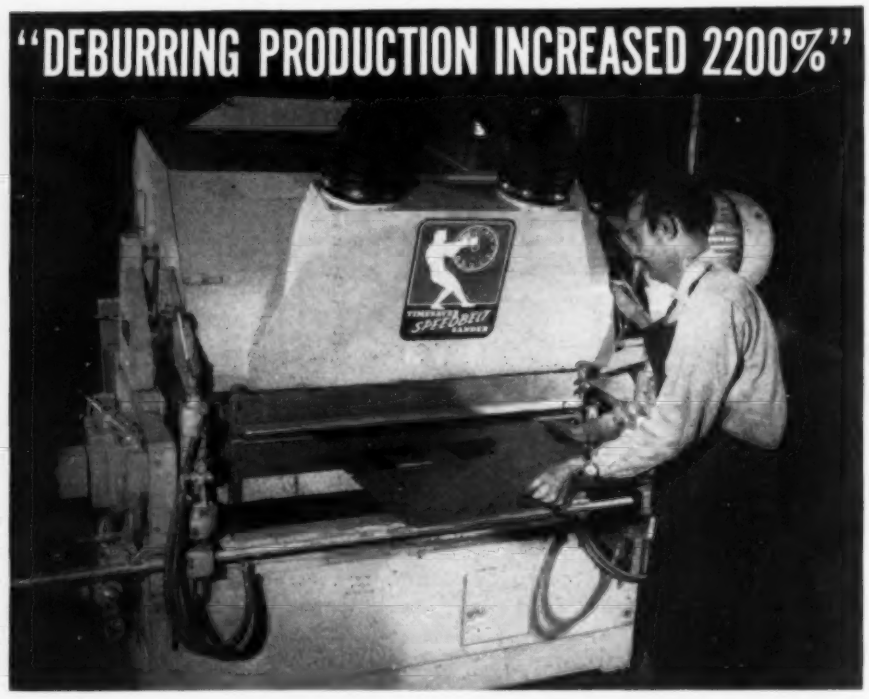
(Section continued on page 75)

"DEBURRING PRODUCTION INCREASED 2200%"



Here's how a TIMESAVERS SPEEDBELT® SANDER helped AMF reduce costs!

AMERICAN MACHINE & FOUNDRY'S Brooklyn, N. Y. plant manufactures many types of sheet metal components for AMF Pinspotters and other AMF machines. Steel plate deburring and cleaning operations are now completed *22 times faster* since installing a Timesaver Model TOP-40.

Unit production time on large 30" x 48" metal cabinet parts has been cut from 9½ minutes to 26 seconds. The *Speedbelt* also produces superior finishes for plating and painting. Result: a substantial saving in time, materials and manpower.

Investigate the advantages of Timesaver wide abrasive belt finishing and deburring for your plant. Write today for fact sheet and prices.

TIMESAVERS SANDERS, INC.
Dept. R-16, 5270 HANSON CT.
MINNEAPOLIS 22, MINN.

Timesaver "Speedbelt" Sanders are manufactured under one or more of the following U. S. Patents: 2,813,352; 2,860,454; 2,876,600; 2,934,863; 2,958,989 with other patents pending.

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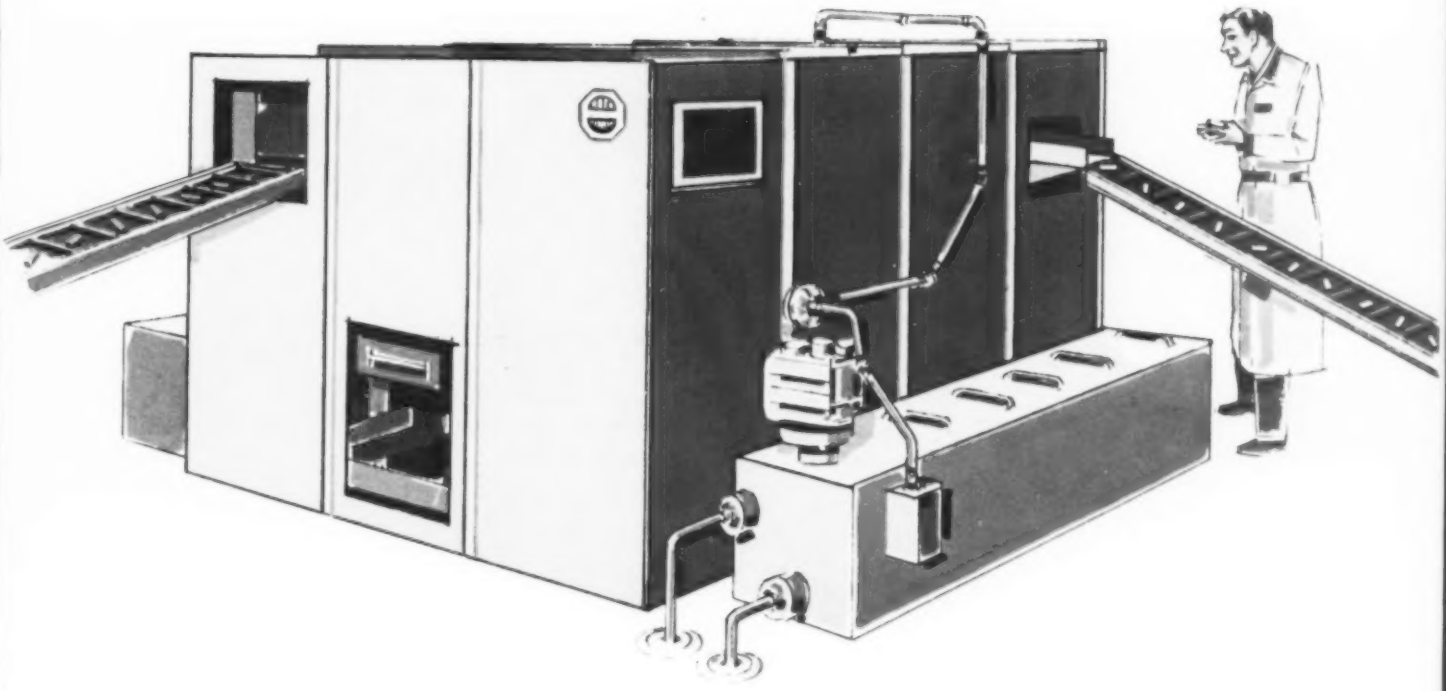
***Automatic continuous or automatic batch-type finishing can be yours with the* NEW**

AUTOMATIC VIBRATRON®

by ROTO-FINISH/RANSOHOFF



IN LARGE PLANTS OR SMALL PLANTS, for continuous production or batch-type production, this new ***automatic*** *system cuts finishing costs.*

Eliminate direct labor. Reduce compound and media cost. Simplify materials handling, and improve quality . . . with the New Automatic Vibratron. You can place this machine ***anywhere*** *in your production line.*

Read How It Does More Work In Less Time At Lower Cost

Use postpaid card. Circle No. 258

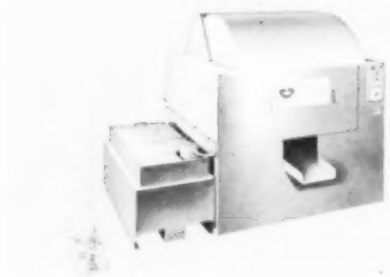
BIG SAVINGS in Automatic Finishing Are Now Possible with the New

AUTOMATIC VIBRATRON®

For complete production flexibility, the Automatic Vibratron is available in two basic types, the Batch Automatic for batch production, and the Continuous Automatic for continuous production. Each is available in a complete range of sizes and capacities.

BATCH-TYPE AUTOMATIC VIBRATRON

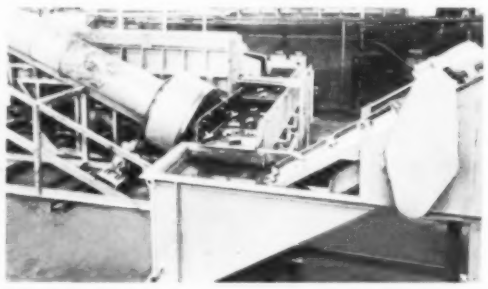
This revolutionary design eliminates direct labor. Can be integrated with existing production equipment *anywhere in the plant.* The only facilities required are electric power, water, and your plant drain. Parts are introduced to the machine, processed, and separated *automatically.* Are fed to the machine by tote box, conveyor, or accumulating hopper. Machine cycling is timer sequenced.



CONTINUOUS AUTOMATIC VIBRATRON

The Continuous Automatic Vibratron finishes parts on a continuous through-feed basis. No operator is required. Any process, or combination of processes can be provided. Media re-sizing, rinsing, compound recirculation, parts separation, and drying are *all automatic.*

Automatic Vibratrons are now deburring automotive transmission valves . . . preparing zinc die castings for electrostatic painting . . . finishing golf club heads for plating . . . deburring complex, 14" long die castings . . . and final finishing precision rollers for bearings to 4 micro-inch smoothness.



HOW MODERN ARE YOUR FINISHING METHODS? CHECK AGAIN. THEN MAIL THIS COUPON . . . TODAY

VIBRATRON IS A REGISTERED TRADEMARK OF THE ROTO-FINISH COMPANY. FOREIGN AND DOMESTIC PATENTS APPLIED FOR.

ROTO-FINISH/RANSOHOFF
3700 MILHAM ROAD
KALAMAZOO, MICHIGAN

GENTLEMEN: Please furnish us complete information on the Automatic Vibratron. We are interested in ( ) Continuous Automatic Finishing ( ) Batch-Type Automatic Finishing of _____.
(indicate part to be finished)

It is made of _____.
(type of metal or material)

NAME _____ TITLE _____

FIRM _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

WORLD-WIDE SKILL AND EXPERIENCE

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ARGENTINA - Roto-Finish Argentina - Buenos Aires
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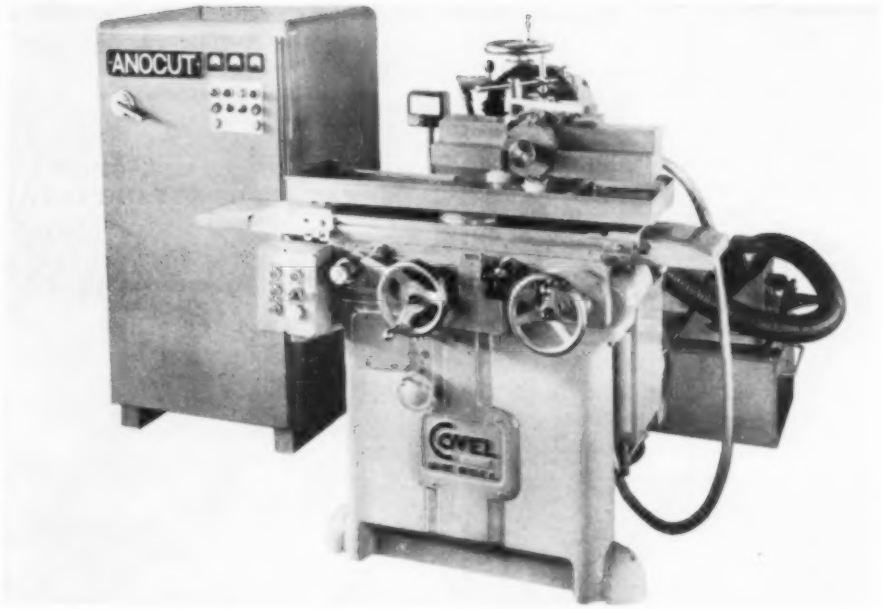
ENGLAND - Roto-Finish Ltd. Hertfordshire
FRANCE - Societe Roto-Finish - Paris / GERMANY, AUSTRIA, NORWAY, DENMARK, PORTUGAL, SWEDEN, SWITZERLAND, YUGOSLAVIA, JAPAN - Matallgesellschaft A.G. - Frankfurt, a.m. - Germany
HOLLAND, BELGIUM, LUXEMBURG - N.V. Roto-Finish Maatschappij-Delft, Holland
ITALY - Societa Roto-Finish Italiena a R.L. - Milan
SPAIN - Institute Electroquimico, S.A. - Barcelona



CUTTER, TOOL GRINDER USES ELECTROLYTIC POWER PACK

A new Covel tool and cutter grinder (Model 12B) has been especially designed to use an Anocut electrolytic power pack for grinding a variety of carbide face mills, end mills, counterbores, reamers, and similar tools.

The use of the electrolytic process results in three principal improvements over conventional grinding of carbide. Stock removal, for one, is two to five times faster than conventional diamond wheels. In a test on this machine, an 8" carbide face mill was sharpened with a stock removal rate of .001" per second.

For another, diamond wheel life is increased. Field reports indicate useful wheel life five to ten times that of conventionally used diamond wheels.

Very little heat is generated. For that reason, grinding cracks in the carbide rarely occur.

The spindle head tilts 15° each way for rapid setting of clearance angles. The spindle also has an air-operated automatic indexing device, so that it is not necessary for the operator to touch the work or the work head during grinding.

The table has automatic reciprocating movement with adjustable stroke 0 to ½" at a rate of 43 strokes per minute. When plunge grinding, the tool is moved across the entire wheel face.

Covel Manufacturing Company, Benton Harbor, Michigan.

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HEAVY DUTY CHEMO-TEXTILE FOR PRODUCTION LAPPING

Pellon PAD is the first heavy-duty high-density polishing chemo-textile for use in production lapping and polishing.

PAD is a semipermanent tool surface that will maintain flatness to ½ millionth of an inch, and outwear hard metal laps fourfold.

Its unique property of boosting abrasive performance is a key factor in more economical lapping operations. Costs are reported drastically reduced in finishing gage blocks, mechanical seals, optical flats, ceramics, and precision components.

Geoscience Instruments Corporation, 110 Beekman Street, New York 38, New York.

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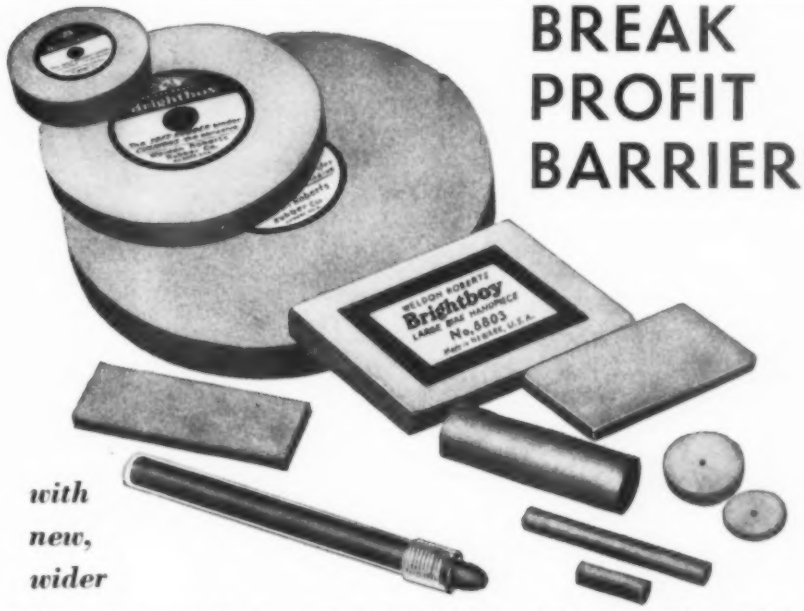

BREAK PROFIT BARRIERS

with new, wider

TIME-SAVING ABRASIVE APPLICATIONS

Simultaneously BURR • CLEAN • FINISH • POLISH

on Metals • Wood • Glass • Fiberglass • Laminated Materials • Some Plastics

with *Rubber-Cushioned* BRIGHTBOY

YOU MUST SEE BRIGHTBOY'S EXCEPTIONAL ACTION ACHIEVED BY *ABRASIVE & RUBBER, functioning simultaneously*, to appreciate its almost unbelievable *ability* and *adaptability*. *Saves as much as 50% in time over older, costlier methods!*

JOB-MATCHED, TIME-&-MONEY-SAVING STOCK SIZES & TEXTURES are specially suited to your production requirements; bridge the gap between the grind and buff in one operation; frequently provide the finish that constitutes the final polish.

Immediately available wheels, sticks, rods, blocks and points for machine and manual work. Wide range of Silicon Carbide and Aluminum Oxide textures—extra fine to extra coarse—in soft, semi-firm, firm and tough rubber binders. The only complete, comprehensive stock line of soft rubber bonded abrasives.

WRITE US YOUR WORK REQUIREMENTS. GET OUR METHODS & APPLICATIONS DATA; comprehensive list of job-matched stock items; attractive prices; the BRIGHTBOY CATALOG-MANUAL.

BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO.
95 North 13th Street Newark 7, N.J.
America's Pioneer Manufacturer of Rubber-Bonded Abrasives

WELDON ROBERTS Brightboy RUBBER CUSHIONED ABRASIVES

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CYLINDRICAL GRINDER IN HIGH-PRODUCTION VERSION

The Myford MG-12-H hydraulic cylindrical grinding machine, recently introduced by Bentley Industrial Corporation, is a high-production version of the MG-12.

Both will hold tolerances in millionths. The MG-12-H engineered to grind round to .00002", parallel within .00002", repeat to .00001", and finish to 3 microinches.

The MG-12-H hydraulic machine is equipped with a ¼ hp workhead motor—up from 1/6 hp. There are 12 work speeds: 6 in the low range from 75 to 390 rpm, and 6 in the high range from 160 to 780 rpm, obtainable through a built-in dc rectifier. Wheelhead motor is 1½ hp. There is a tailstock type dresser in addition to the table mounted dresser, making it unnecessary to disturb the setup at any time.

Bentley Industrial Corporation, 21-19 46th Avenue, Long Island City 1, N.Y.

Use postpaid card. Circle No. 46

DIAPHRAGM CHUCK SHOWS REPEAT ACCURACY IN TENTHS

New air-operated diaphragm chuck (Erickson Tool Company) has extra-short overhang and special hardened and ground master jaws. Quick-acting unit provides high-speed chucking with repetitive accuracy in very low tenths.

The workpiece is chucked and released by compressed air operating on a piston which flexes the steel diaphragm, opening the jaws the necessary few thousandths of an inch. When pressure is removed, the diaphragm flattens, closing the jaws and gripping the work.

Erickson air-operated diaphragm chucks for internal or external chucking, are made in 5½" diameter 3-jaw models, 7" diameter 4-jaw and 10" diameter 6-jaw sizes. These chucks are frequently engineered to suit specific work.

Erickson Tool Company, 34350 Solon Road, Solon, Ohio.

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SPECIAL DRIVING CENTERS MAKE ONE CHUCKING DO

A special line of Powergrip driving centers has been engineered to hold tubular work for OD grinding. Usually two handlings are required, with the work piece reversed between operations.

Completely finishing the work piece in one chucking saves time, produces work to closer concentricity limits.

This style center is used when the OD must be finished from end to end, or when any outside holding would interfere with tools.

Powergrip, Incorporated, Rockfall, Connecticut.

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Grinding or Finishing ?

30 years of experience separate the NIKKEN from others!

It's the history of persistent research and development because of which the company has found the only reason of its existence in the grinding and finishing field. Now, even a single unit cannot pass through the company's quality control tests without the standard of quality that cannot be paralleled by others.

Yes, "development and research" is the words of NIKKEN's exclusive abrasives, which cannot be surpassed by any other make. And, because of the highest acceptance in the field, NIKKEN has the biggest share of Japan's overall production and sales.

NIHON KENSHI COMPANY, LTD.
(NIHON ABRASIVE CO., LTD.)
Bingo-machi, Osaka, Japan. Cable : "NIHONKENSHI"

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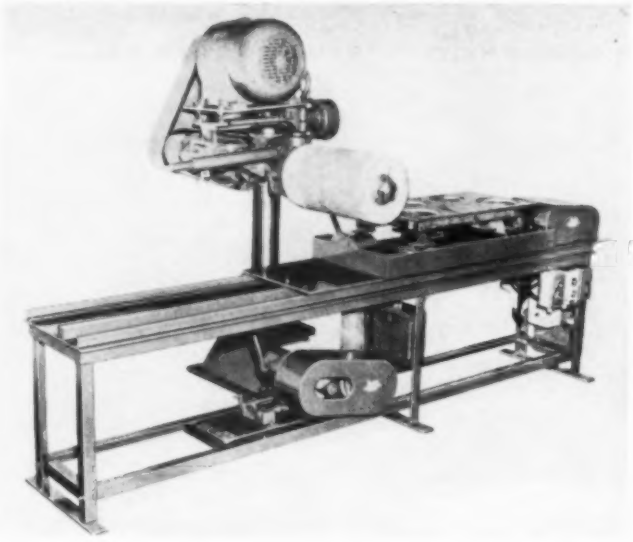
STRAIGHT LINE BUFFER OSCILLATES TO FINISH FLATS



A new automatic reciprocating type straight line buffing machine has been designed for buffing and satin finishing surfaces of flat shaped parts such as stainless steel stove, table and sink tops, brass name plates, kick plates and grille work.

The machine consists of an oscillating work holding fixture mounted on a reciprocating platen. An Acme G-1 floating head fully adjustable heavy duty buffing lathe performs the finishing operations as the part is reciprocated and oscillated under the buffing wheel. A solenoid-operated timer control permits the work to reciprocate under the wheel for a predetermined time cycle.

The oscillating fixture provides uniform wheel wear, eliminates buff streaking and permits the use of buffing lathes that do not incorporate stroking type-spindles. The motor driven and mechanically actuated fixture oscillates a total of ¼" at a speed of 200 oscillations per minute.

The reciprocating platen is actuated by a motor driven rack and pinion arrangement. The platen has an adjustable travel actuated by a reversing controller and two limit switches. Platen speed can be varied with a 3 to 1 variable speed drive having a normal range of 5 to 15 feet per minute.

The adjustable lathe used on the machine can be equipped with the Acme interchangeable motorized drive units for automatic buffing wheel wear compensation to maintain correct finishing pressure throughout the life of the finishing member.

The machine illustrated is 24-inches wide, 14 feet long and satin finishes stainless steel stove tops. The length of the machine is dependent on the type and size of part to be finished.

Acme Manufacturing Co., 1400 East Nine Mile Road, Detroit 20, Michigan.

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continued

PEKAY

for RESINOID and RUBBER BONDED GRINDING and POLISHING WHEELS . . .

. . . Pekay Has Pioneered

almost every major advance in a specialized line of rubber and resinoid bonded wheels used in such industries as aircraft, cutlery, and major fabricators of stainless and carbon steels.

Write for new literature today!

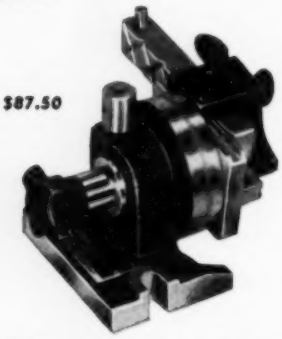
PEKAY ABRASIVES, INC.
271 Grove Ave., Verona, N. J.

Use postpaid card. Circle No. 241

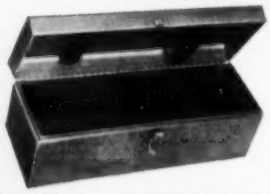
Angle Tangent to Radius WHEEL DRESSING *Simplified* WITH ROTHFUSS TOOLS

THE G-5 RADIUS DRESSER is a precision engineered tool that will dress either a convex or a concave radius from .015" to 1.750" on all wheels up to 10" and it may be set to the exact radii desired. Graduated stops allow you to dress any desired portion of a radius. The spring tension journal insures chatter free operation
Price $80.50

Price $87.50



THE G-2 ANGLE DRESSER AND TOOL HOLDER is actually two tools in one, having an easy to read vernier scale 0° to 180° giving accuracy within 2" of 1°; an excellent time saver to set up jobs to be milled, drilled, tapped on any desired angle.



FREE STORAGE CASE of light-weight steel, with a hinged top, heavy duty latch and a blocked interior to insure the safety of the dressers when carried.

OUR FIXTURES will dress most radii and angles tangent each other, similar to those shown below.

All for only **$149.50** *(including case and both tools with diamonds)*

Distributorship available in select territories

ROTHFUSS TOOL COMPANY
BOX 2696 · ELMWOOD STATION · PROVIDENCE 7, R. I.

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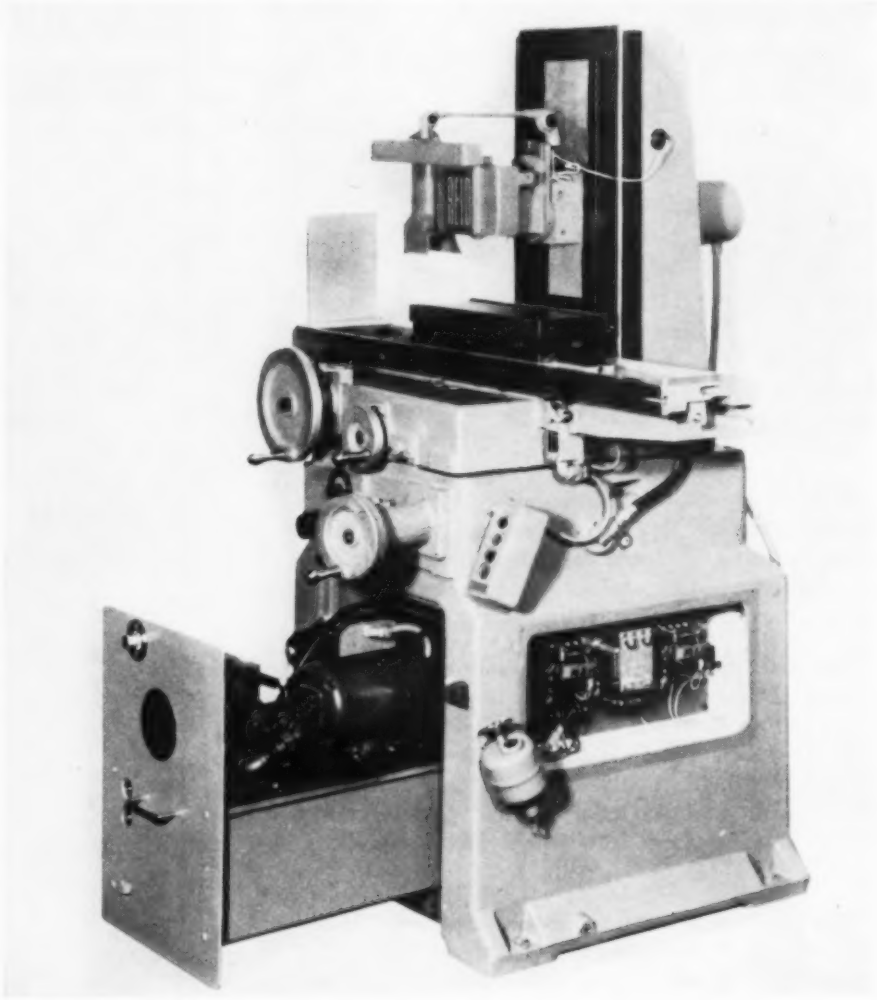
SURFACE GRINDER SHOWS NEW HYDRAULIC POWER PAC



An all-hydraulic surface grinder, Model 618-HYD, from Reid Brothers, features a low pressure hydraulic power pac with electric valve controls and double pump.

The hydraulic system was especially designed by Reid in consultation with United Engineers of Boston. The entire hydraulic package is contained in a handy pull-out drawer for easy maintenance. Simplified piping and electrical systems are employed. The double pump provides separate hydraulic circuits for table and cross slide motions. The hydraulic system is also designed to prevent troublesome air pockets from forming in the lines.

A unique feature of the new Reid Hydraulic makes it possible for the operator to switch from power to hand feed and back instantly with the flick of a lever. He can change to any combination of hand and power to the cross feed and table without stopping the grinder. By the use of electro-hydraulic pilot valve control, Reid has eliminated the usual need to disconnect a table cylinder when making changes.

Its 2500 pound weight, an extra wide base, and engineering refinements in the hydraulic system provide the new grinder with exceptionally smooth operation and shock free table reversal.

Operation and maintenance are further simplified by special dust cleanout ports back of the table, sight gauge hydraulic tank, two-speed rapid traverse cross slide for fast wheel dressing, and finger tip controls. Table speed is variable to 125 FPM and cross feed is variable to .250 inches.

Reid Brothers Company, Inc., Beverly, Massachusetts.

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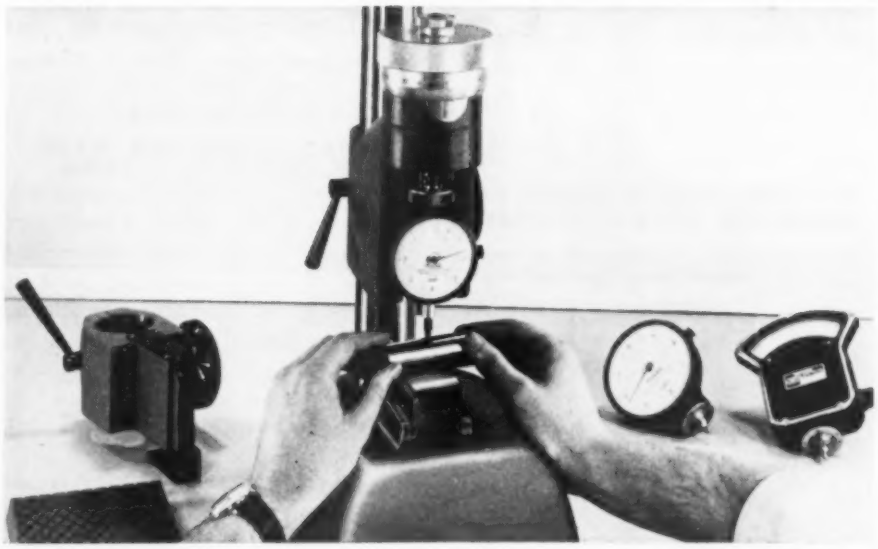

MULTI-CHOICE COMPARATOR

A versatile, high-precision comparator offers a wide selection of gaging methods and accessories. The basic unit is a sturdy base and precision column on which can be assembled a choice of dial indicator gaging units or air, electric, or electronic gage heads. Increasing the unit's adaptability are a variety of interchangeable reference surfaces.

One combination features a micrometer head with a .0001" dial indicator. By utilizing the one-inch range of the micrometer, settings up to 8" can be made using just three gage blocks.

The alternative holding arm has a fine adjustment with no play or backlash, and is used for other dial gaging instruments as well as the air, electric, or electronic heads.

Federal Products Corp., Providence 1, Rhode Island.

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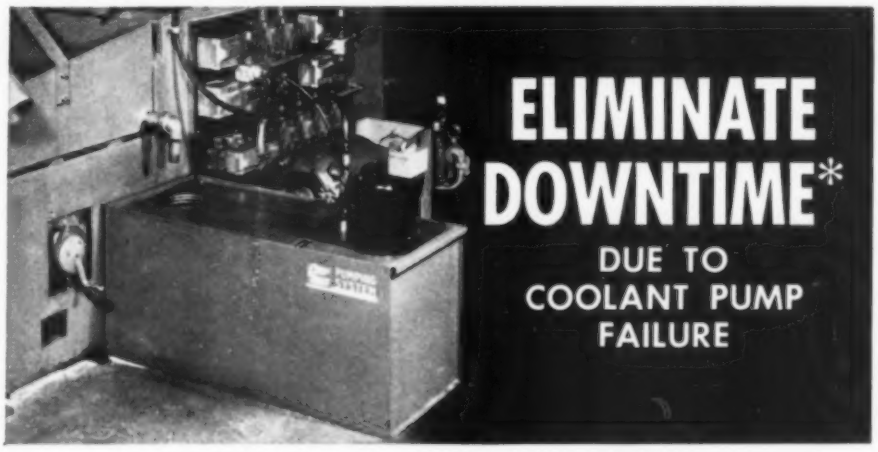

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DUE TO COOLANT PUMP FAILURE

GRAYMILLS
SUPERFLO COOLANT
PUMPING SYSTEMS

*Installed in a matter of minutes, GRAYMILLS Coolant Pump and Tank Units eliminate production downtime by being ready to go when built-in units fail. GRAYMILLS Pumping Systems are easy to clean, can be used with liquids bearing abrasives and will handle any type coolant or cutting oil. Available with centrifugal or gear type pumps, 1/25 to 1/2 HP, in tank capacities of 2 to 128 gals.

Every plant needs one or more reserve GRAYMILLS Pumping Units as insurance against production downtime. Get yours today! They're sold by leading Industrial Distributors everywhere.

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FOR TOOL AND CUTTER GRINDING

INCREASE WHEEL LIFE 50%

You can remove more stock, faster, with less wheel wear, when you use the new PRECISION "BH" Resinoid Bonded Tool and Cutter Diamond Wheels.

This is another PRECISION first in industry. By radically new production methods, the diamond cutting particles are attached to the resinoid bond. It wets and holds the diamonds. Users report up to 50% increased wheel life.

Ask for and try the following grade: MD150 N100 BH.

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DRESS ABRASIVE BELTS FOR 30% LONGER LIFE

Unique Desmond Beltbrasive® dressers increase abrasive belt life 30% or more . . . give you "new" surface efficiency throughout belt life. Patented dresser quickly cleans out loaded belts, drums or discs on metal, wood or plastic jobs. One light pass when belt begins to load is all you need. Typical model costs less than $7. Ask your Desmond distributor.

The only complete line of grinding wheel dressers and cutters

Desmond

The Desmond-Stephan Mfg. Co.
Urbana, Ohio

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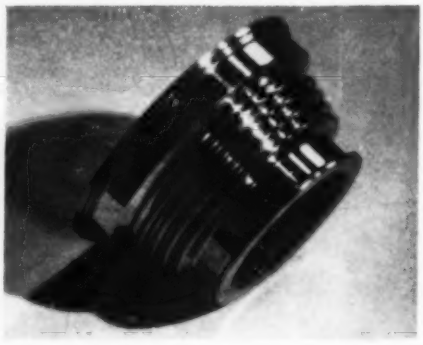
NEW EQUIPMENT continued

CUSTOM-GROUND CRUSH ROLLS FOR ABRASIVE WHEELS



Crush rolls ground to customer's specifications and to fit any type of grinding wheel crusher can be furnished within seven days of receipt of sample part or print by Twin City Manufacturing Co.

The rolls are used on grinding wheel crushers to form intricate precision shapes in grinding wheels. One of the shapes is illustrated

Twenty-four hour service is provided on quotations.

Twin City Manufacturing Co., 2201 Washington Ave., North, Minneapolis 11, Minnesota.

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COMPACT TUMBLING MACH. DRIES, DEBURRS, CLEANS

A new compact tumbling machine, the Grav-i-Flo Model PD-10 can be used for cob meal or sawdust drying of metal parts, as well as deburring and burnishing, or cleaning operations. Weighing about 160 lbs., the machine has a cylinder capacity of 6 cubic feet and is furnished with either 1/3 or 1/2 hp motor drives.

Priced under $400.00 the Grav-i-Flo PD-10 is of fabricated steel construction with a simple lock pin mechanism allowing three tilting positions, load, unload, and running. Although the cylinder is furnished unlined as standard equipment, neoprene lined cylinders are available.

A separating bin, generally used to separate sawdust or cob meal from metal parts, is available with the unit. The bin size is 14½" high x 38" wide x 41" long.

Grav-i-Flo Corporation, Sturgis, Michigan.

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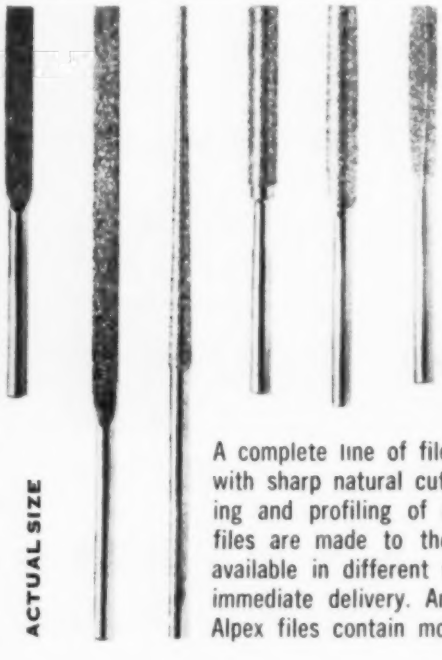

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MORE DIAMOND PER DOLLAR

A complete line of files made from selected quality diamonds with sharp natural cutting edges exposed. For use in machining and profiling of carbide and ultra-hard materials. Alpex files are made to the standards of American industry, are available in different shapes and sizes, and are in stock for immediate delivery. An examination and trial will prove that Alpex files contain more working diamond surface per dollar.

FLAT • LONG FLAT • TAPER ROUND • ROUND • OVAL • TRIANGULAR

MADE IN U.S.A.

ALPEX DIAMOND FILES • ALPEX DIAMOND WHEELS

ALPEX WHEEL COMPANY

TEANECK, NEW JERSEY

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TWO CHAPTERS EXPLORE ABRASIVE MACHINING CONCEPT

Richard H. Merritt, product planning engineer of the Norton Company, Worcester, Massachusetts, has recently visited two chapters to explain the Norton research project, "Abrasive Machining." Eighteen attended the September meeting of the Saginaw Valley chapter, and sixty-five, the October meeting at Chicago.

"In most shops," the speaker said, " metal removal is commonly divided into three areas: snagging, where stock removal is heavy, but where surface finish and close tolerances are of no concern; grinding, where close tolerances and good surface finish are supreme, and where stock removal is a minor consideration, and machining, which is moderate to high in stock removal, and in the middle on the other two factors."

The last area has traditionally been reserved for cutting tools, but abrasives are showing that they can do many of these operations more efficiently and economically, to save money for users. For instance, taps which were formerly machined with cutting tools are now ground complete, not because of any preference for abrasives, but simply as a cost-reduction necessity for survival in present-day competition.

Traditional thinking was cited as a major obstacle.

Another was accounting methods which lump cutting tools in with overhead, since it would cost more than the tools are worth to isolate them, while grinding wheels are established as direct expenses. With this procedure, grinding operations must not only carry their own costs, but must also share part of the overhead costs of single-point tool operations.

PITTSBURGH CHECKS OUT STEEL PLANT GRINDING

"Grinding Machines in the Steel Industry," with James L. Hensley, vice president of Ty-Sa-Man Machine Company, Knoxville, Tennessee, as speaker, drew 54 members and guests of the Pittsburgh chapter to the September meeting.

The group got together at Stouffer's restaurant on September 28.

Richard H. Merritt

VAN NORMAN PANEL ON COST SAVINGS IN GRINDING

George Burns, vice president of Van Norman Machine Company, led a panel which discussed "Cost Savings in Grinding" at the Connecticut chapter's first meeting, held September 25 at Sun Valley Acres, Meriden, Connecticut. Francis Healy, vice president, engineering, and Ralph Simons, sales engineer, both also of Van Norman, completed the panel.

A total of 98 men—64 chapter members, 3 members from other chapters, and 31 guests—heard the talk and asked questions.

Morrey Patterson of GRINDING and FINISHING (left) exchanges greetings with Don Hesling of Sealed Power Corporation at the Western Michigan Chapter meeting, Muskegon, Michigan, September 18, 1961.

DIRECTORS MEET AT READING SEPTEMBER 9, 10

Membership, finances, and local chapter-national headquarters relationships were among the topics discussed at the regular meeting of the National board of directors, at Stokesay, Reading, Pennsylvania, September 9-10, 1961.

Visits by the national president to local chapters and increased participation of local chapters in national affairs were developed as two measures to improve communications between national and the local chapter.

LONG ISLAND TRIES TROIKA; THREE MEMBERS SPEAK

Three members of the Long Island chapter divided speaker's honors at the first meeting, held September 13 at Wheatley Hills Tavern, Westbury, L. I., New York.

Camillo Honor, Jr., of J. Soehner & Sons, and chapter president led off with a discussion of quality control in machine operations.

Next was Joseph P. Urgo, Di-Tru Diamond Tool Co., and chapter treasurer, who spoke on diamond tool setting.

Completing the program was a talk on tap reconditioning by Francis J. Cinelli, Pioneer Tool Crib, Inc.

WESTERN MICHIGAN HAILS LARGEST TURNOUT

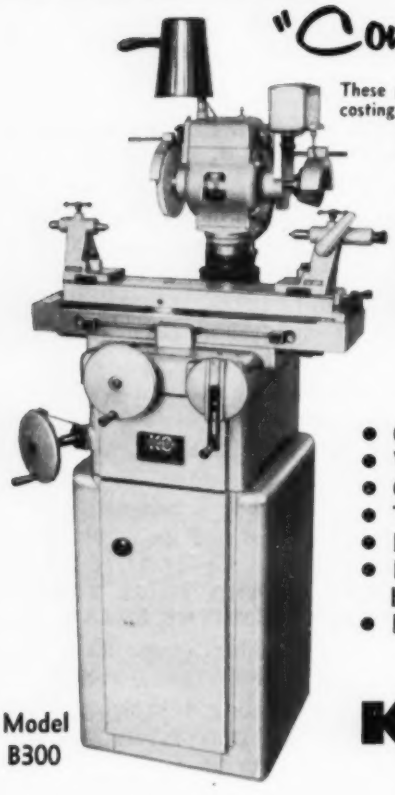
One hundred seventeen members and guests, the largest attendance in Western Michigan chapter history, turned out to tour the new research center of Sealed Power Corporation and listen to a talk by Don Hesling, Sealed Power vice president for research and engineering, on engine block cylinder bore honing.

Two national directors, Ted O'Connell, Western Michigan, and Morrey Patterson, Chicago, editor of GRINDING and FINISHING, were introduced and spoke briefly.

New officers were installed: Harvey J. Snell as chairman; Gerald Berry as vice-chairman; and Robert G. Martin as secretary-treasurer. According to a constitutional amendment, they will serve two-year terms.

$895 the NEW! $1230

"Compact" GRINDERS



Model B300

These precision engineered grinders are guaranteed to do anything that machines costing two or three times more will do. Their compactness makes it easier to set up, hold accuracy and turn out more work. Compare these machines for quality, engineering, workmanship, sturdy construction and performance against any grinder on the market. See for yourself how much more you get for how much less you pay.

Model B360 Universal Grinder shown with B943 Work Head available at extra cost.

Model B300 Standard Tool Grinder shown with B922 Matched Set Tailstocks.

features:

- Grinding head speeds 3450 to 20,700 R.P.M.
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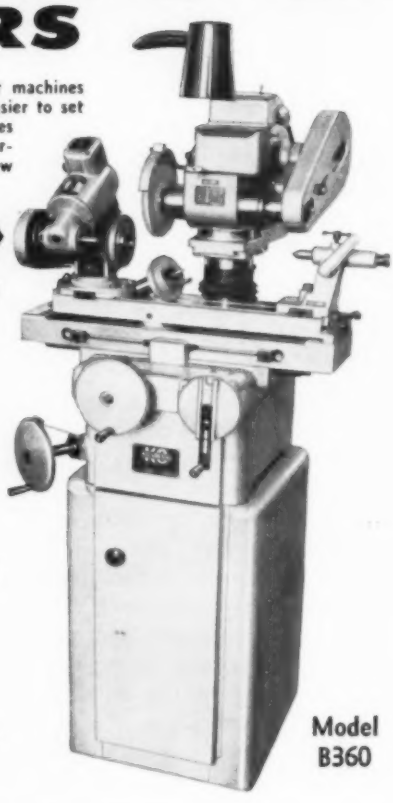
- Cross feed 5", table traverse 10".
- Two speed transmissions.
- Heavy duty cast iron base.
- Maximum swing over table 10¼" with 1" raising blocks.
- Distance between centers 17½".

Write for complete literature and name of nearest distributor.



Model B360

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DAYTON SAFETY TACH

PHOTOELECTRIC TACHOMETER

- PUSH-BUTTON OPERATED
- SELF-CONTAINED
- BATTERY POWERED
- TRANSISTORIZED
- RANGE 0-12,000 RPM*

IMMEDIATE DELIVERY

ONLY **$95.00**

Batteries $4.50 Extra

FOR GREATER SAFETY AND PERFORMANCE

Know running speeds of grinding wheels, spindles, cutters, shafts, shuttles, pumps, fans—any rotating or reciprocating part. Reads constant or changing speeds. Requires no mechanical or electrical contact.

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*MODEL 33A
0-3000 RPM
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DAYTON SAFETY

DAYTON SAFETY GRINDING WHEEL DIVISION
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improved

DIAMOND POWDER SALVAGE SERVICES

Industrial Diamond Powders, Inc. is the pioneer in diamond salvage, with years of experience in this exacting business.

Now, IDP is pleased to announce a new and improved system of diamond salvaging. This new method, used by IDP alone, was developed during recent years in conjunction with Battelle Memorial Institute of Ohio, a noted research institution. The new system gives lower salvage costs, higher yields, and eliminates use of toxic and hazardous heavy liquids still being used by most diamond reclaimers. IDP's Warren Danforth, Chemical Engineer of long experience in diamond technology, and George Danforth, Chemist, are now using this new salvage system to give clients more dependable and higher yields of Natural or Man-made diamonds.

If you use many diamond grinding wheels per year, investigate IDP's salvage services. Either ship a trial lot of your grindings, or send a 2-pound sample for analysis. IDP buys your diamonds or returns them graded for your further use. Your material is fully insured as soon as it reaches IDP's modern plant. IDP is capable of processing sludge from a few pounds to tons in size. IDP reclaims diamonds from sludges, used diamond wheels, lapping wastes, and other materials. Customers who use graded diamond powders generally get sizes they use—no need to stock sizes which must eventually be disposed of.

INDUSTRIAL DIAMOND POWDERS, INC.

BOX 10602 PITTSBURGH 35, PA.
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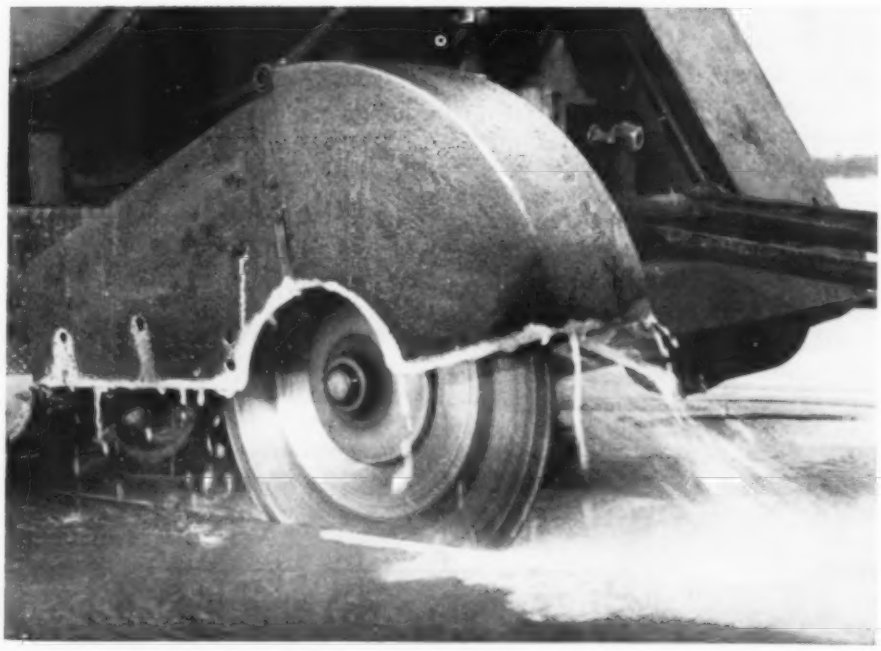
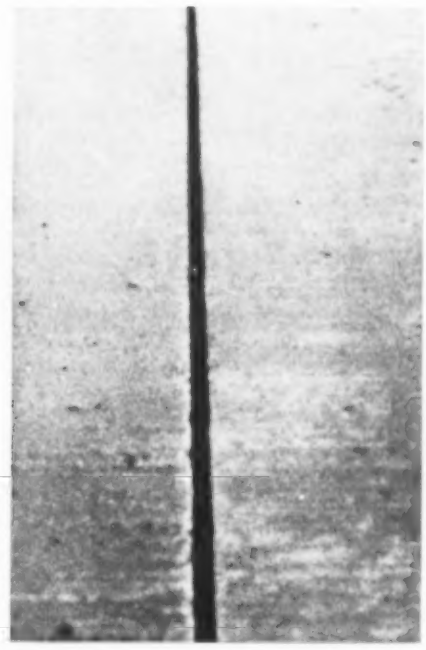
DIAMOND WHEELS SAW 88 MILES OF CONTRACTION AND CONSTRUCTION JOINTS IN DULLES RUNWAYS



Close-up of diamond wheel in action. Quarter-inch wide cuts were made about 25' apart in finished slabs, at a 6' per minute rate.



Note the narrow straight, clean cut.

Tiny particles of natural diamonds will be indirectly responsible for smoother and safer landings of jet air liners when mammoth Dulles International Airport begins operations in the summer of 1962.

Named for the late Secretary of State, John Foster Dulles, the new facilities under construction near Chantilly, Virginia will be twice the size of New York's Idlewild International Airport. Geographically 27 miles from the White House, Dulles International is growing rapidly on a great tract of nearly 10,000 acres. Now visible from the air are extensive runways 11,500 feet in length to accommodate the speed and weight of the newest and fastest jet aircraft.

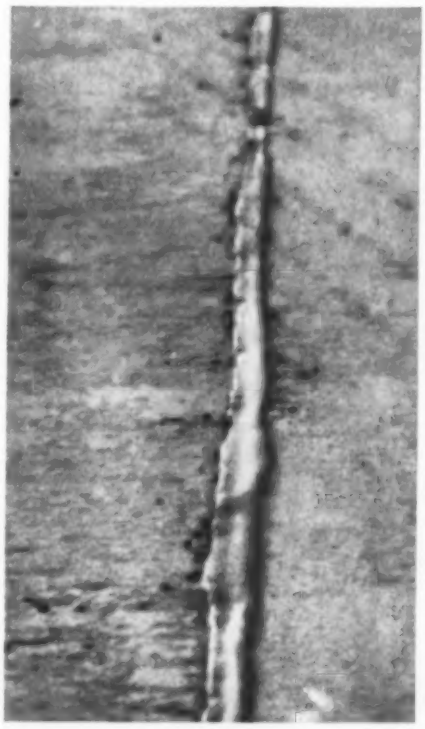
Contraction and construction joints were recently sawed in these runways with standard metal-bond diamond wheels to create carefully planned sections in much the same way that concrete highway joints are sawed with diamond blades for smoother riding surfaces free from bump, spalls and built-in maintenance problems.

Handling this part of the paving project was Pavement Specialists Industries of Kansas City, Mo., under the direction of superintendent Curtis L. Baker, who says "Experience shows that sawed joints are consistently smoother surfaced, better for safety, create a smoother landing surface and result in lower maintenance, particularly where jets are involved."

Eighty-eight miles of diamond-sawed contraction and construction joints were cut and finished at specified intervals on the long runways and taxi strips.

Pavement Specialists Industries began work about Labor Day of 1960 and concluded at the end of June of this year.

continued



This cut has just been sealed.

The cuts were made in the finished slabs about 25 feet apart. Each cut was made one-quarter of an inch wide, by a Clipper diamond cutting blade 12 inches in diameter, and a quarter inch thick. The natural industrial diamonds were supplied by Engelhard Hanovia, Inc., Newark, New Jersey. The depth of the cut varied with the depth of the slab. Fifteen inch concrete was cut to a depth of three inches, while eight and nine inch slabs were cut two inches deep.

Sawing was carried on around the clock. The proper time to saw is determined by climatic conditions and their effect on the rate of cure and shrinkage in the concrete slab once it has been poured, as well as the type and nature of the aggregate incorporated in the concrete mix.

Once the concrete has hardened, it enters into a long period of strength gaining. The period of several hours immediately following the hardening of the concrete is the vital time since the joints must be sawed prior to the development of tensile strengths sufficient to cause random cracking, which development must be anticipated early in the curing process.

At Dulles, the cutting rate was six feet a minute, and the average joint cut in four minutes. Each diamond blade has life expectancy of approximately six thousand inch feet.

Some 150 blades, at a single unit cost of $300.00 were used in making the 88 miles of contraction joint cuts.

The great importance of the diamond-sawed joints is underlined by the fact that such joints bring about reduced costs in three demonstrable ways. They reduce pavement roughness; they eliminate costly built-in problems of maintenance; and they reduce construction costs.

These joints are the only ones inherently capable of providing a durable, smooth riding surface, without bumps and free from spalls, those areas of chipping or splintering of sound pavement, usually along the joints. The diamond sawing blade cuts precise, uniform joints at high speeds, reduces time and costs of labor during construction, and is carried out without interfering with other paving operations.

With regard to maintenance, engineers have found that 90% of paving failures occur in improperly installed joint areas. At the same time, joint areas account for only two per cent of initial costs in construction. The use of the diamond-sawed joints drastically reduces the maintenance problems by eliminating such weaknesses at the crucial point of joint.

Changing Faces . . .

NORTON COMPANY

Arthur Snyder, Jr. has been named controller of the Behr-Manning Division of Norton Company. He succeeds Terence A. Cordner who has resigned.

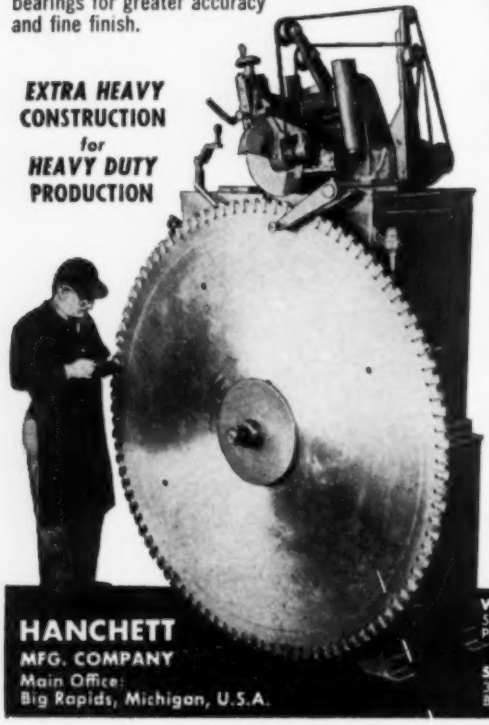
Axel E. Olson replaces Snyder as manager, data processing, at Norton Company headquarters, Worcester, Massachusetts.

Recent Norton Co. sales appointments include Samuel M. Hines, up

HEAVY DUTY GRINDER SHARPENS METAL CUTTING SAWS TO 84" DIA.

For large Diameter Saws of all types, Inserted tooth, Segmental or solid tooth. Adjustable to wide variety of tooth spacings. Extremely heavy duty Construction Ball and Roller bearing throughout. Saw teeth generated by cam control. Adjustable by means of conveniently placed hand wheels to wide range of tooth spacings and depth of saw teeth. Saw is carried on heavy duty roller bearings for greater accuracy and fine finish.

EXTRA HEAVY CONSTRUCTION for HEAVY DUTY PRODUCTION



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If you want to get a personal copy of GRINDING and FINISHING regularly . . .

GRINDING and FINISHING is regularly sent to qualified users of abrasives at their companies.

The magazine is also available on subscription to anyone interested as explained below. (Supplier members of the American Society for Abrasives: $4.50 per year.)

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☐ Rough grinding
☐ Coated abrasives
☐ Abrasive grain
☐ Buffing, polishing

Arthur Snyder, Jr.

Malcolm T. Hunt

Jack Arnst

to grinding wheel sales representative from field specialist in the Philadelphia area, and William T. Hildick, recent sales training graduate, to be field specialist in Chicago.

MACKLIN COMPANY

Malcolm Hunt, vice-president and director of sales of the Macklin Company, Jackson, Mich., has been promoted to the post of assistant to the president. Jack Arnst, former sales manager, succeeds him as director of sales.

One of Arnst's first appointments was that of W. L. "Wib" Wolfe as Macklin representative in the Indianapolis, Indiana area.

CARBORUNDUM COMPANY

Freeman J. Hill, formerly an abrasives salesman in the Philadelphia sales district, has been appointed bonded abrasives sales manager of The Carborundum Company's southern district with headquarters in Atlanta, Georgia.

PANGBORN CORPORATION

Alex J. Szabo has been re-assigned from supervisor, Vibratory Finishing Division, Pangborn Corporation, to sales engineer, Cleveland district.

Dependability

diamond wheels by

THE PAUL L. KUZMICK CO.

271-279 GROVE AVE.

VERONA, N. J.

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suspension type

FLEXIBLE SHAFT MACHINE

eliminates tooling problem for I.B.M.

International Business Machines Corporation had the problem of reaming holes .813" in diameter in the mounting hanger on the main base of their 407 Accounting Machine. To eliminate expensive tooling for this operation, they selected a STOW V50 portable flexible shaft machine, specially fitted with an on-off switch mounted on the handpiece.

The V50 machine delivers 1150, 2100, 3450, or 5750 RPM, is furnished with a 6 foot flexible shaft. Other speeds can be achieved by using different size pulleys (I.B.M. ran the reamer at 750 RPM.)

Available in either ¾, 1, 1½ or 3 HP, the V50 can be used for grinding, buffing, sanding, wire brushing and drilling.

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. . . This Product Took Two Steps* to Profit with SPEEDLAP

- FLAT SURFACING
- NO PRE-GRINDING
- STAINLESS STEEL
- .004 STOCK REMOVAL

The SPEEDLAP 32 Lap-Grinds vital steam trap parts with tremendous savings in time, labor and money.

*Only Two Steps from raw screw machine stock to finished flat, sized parts at highest production rates.

Write for complete details on how YARNALL-WARING of Philadelphia is using the SPEEDLAP 32 Lap-Grinding process to save time, money and labor as described in the SPEEDLAP Job Fact Sheet No. 761A.

SPEEDLAP CORPORATION

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Performance

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THE PAUL L. KUZMICK CO.
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Around the Industry . . .

MID-WEST OF CANADA BUYS WHEEL-MAKING FACILITY

Mid-West Abrasive Company of Canada, Ltd., wholly-owned subsidiary of the American firm by the same name, recently purchased the manufacturing facilities of Macklin of Canada, Ltd. in Harrow, Ontario.

The announcement was made by A. C. Reppenhagen, Jr., vice president-marketing, of the parent Mid-West Abrasive Company, Owosso, Michigan.

In making the announcement, Reppenhagen said the plant will manufacture grinding wheels for the Canadian market. No personnel changes are planned at this time, in the manufacturing end of the operation, but the Harrow plant's sales will be integrated with the Mid-West offices located at Strathroy.

Mid-West now is able to market a complete line of vitrified products in sizes ranging from ½-inch to 42-inch wheels, plus a complete line of resinoid wheels.

DE SANNO BUYS KEYSTONE ABRASIVE FACILITIES

A. P. de Sanno & Son, Inc., Phoenixville, Pennsylvania, has purchased the property, plant and all manufacturing facilities of the Keystone Abrasive Wheel Company, Carnegie, Pennsylvania.

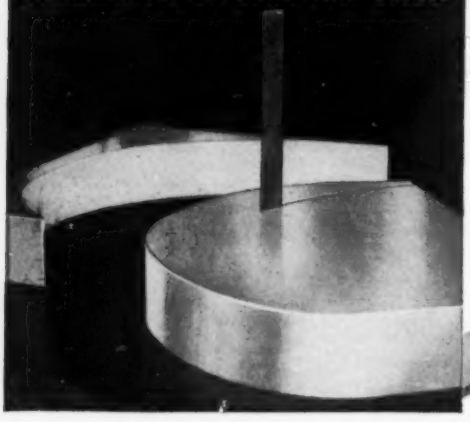
The former Keystone plant will be operated as a division of de Sanno's main plant, and will resume operations in Carnegie as soon as necessary repairs and maintenance are completed.

FORM AIR FILTRATION FIRM

Formation of Honan Associates, Inc., Lebanon, Indiana, has been announced by Paul R. Honan, president. The firm will manufacture and distribute air filters incorporating a new principle in self-cleaning units using permanent filter media for use in commercial and industrial air moving and conditioning systems.

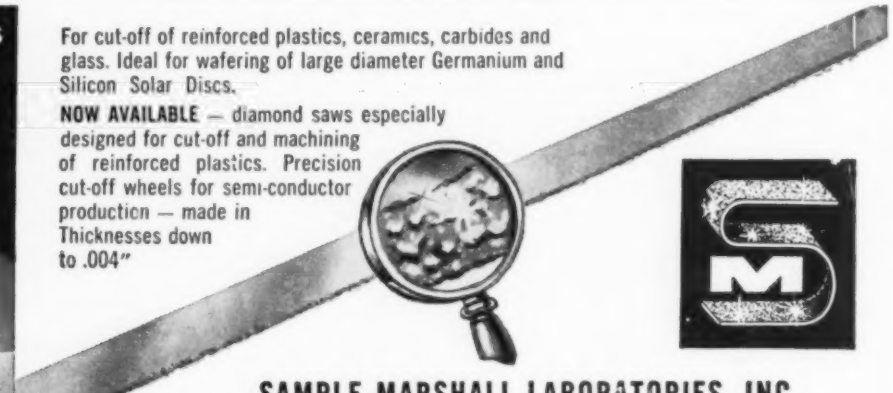
Other officers of the firm are Buren C. Crane, vice president, and C. Bratton, secretary-treasurer.

Diamond Coated Band Saw Blades



For cut-off of reinforced plastics, ceramics, carbides and glass. Ideal for wafering of large diameter Germanium and Silicon Solar Discs.

NOW AVAILABLE — diamond saws especially designed for cut-off and machining of reinforced plastics. Precision cut-off wheels for semi-conductor production — made in Thicknesses down to .004"



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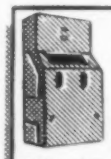

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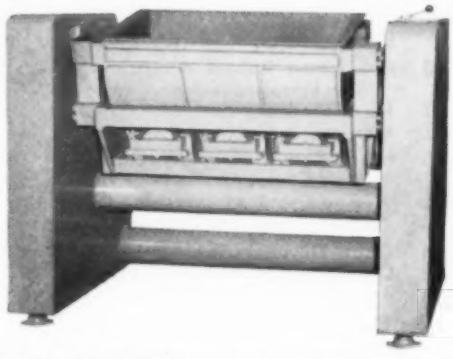

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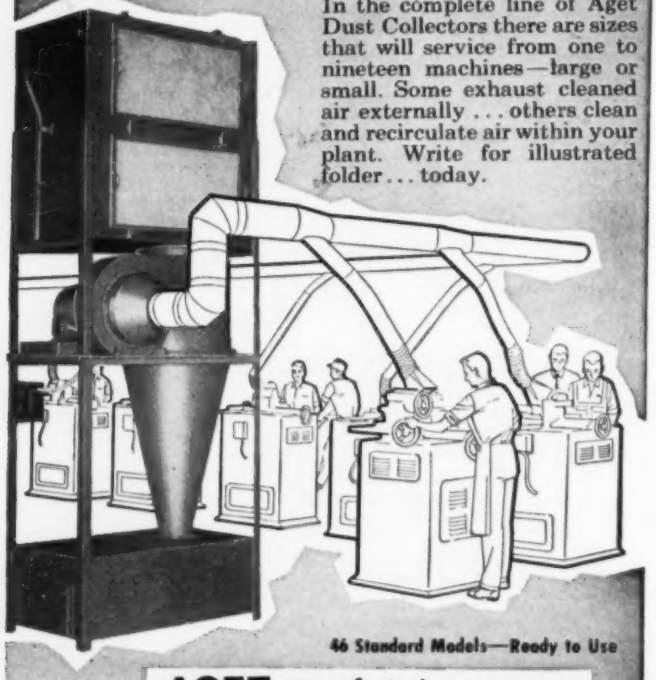

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Grinding and Finishing

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Centerless: High-Production OD Grinding—Part II

Wheels, machines, attachments and work set-ups are to be discussed in the second part of this basic series.

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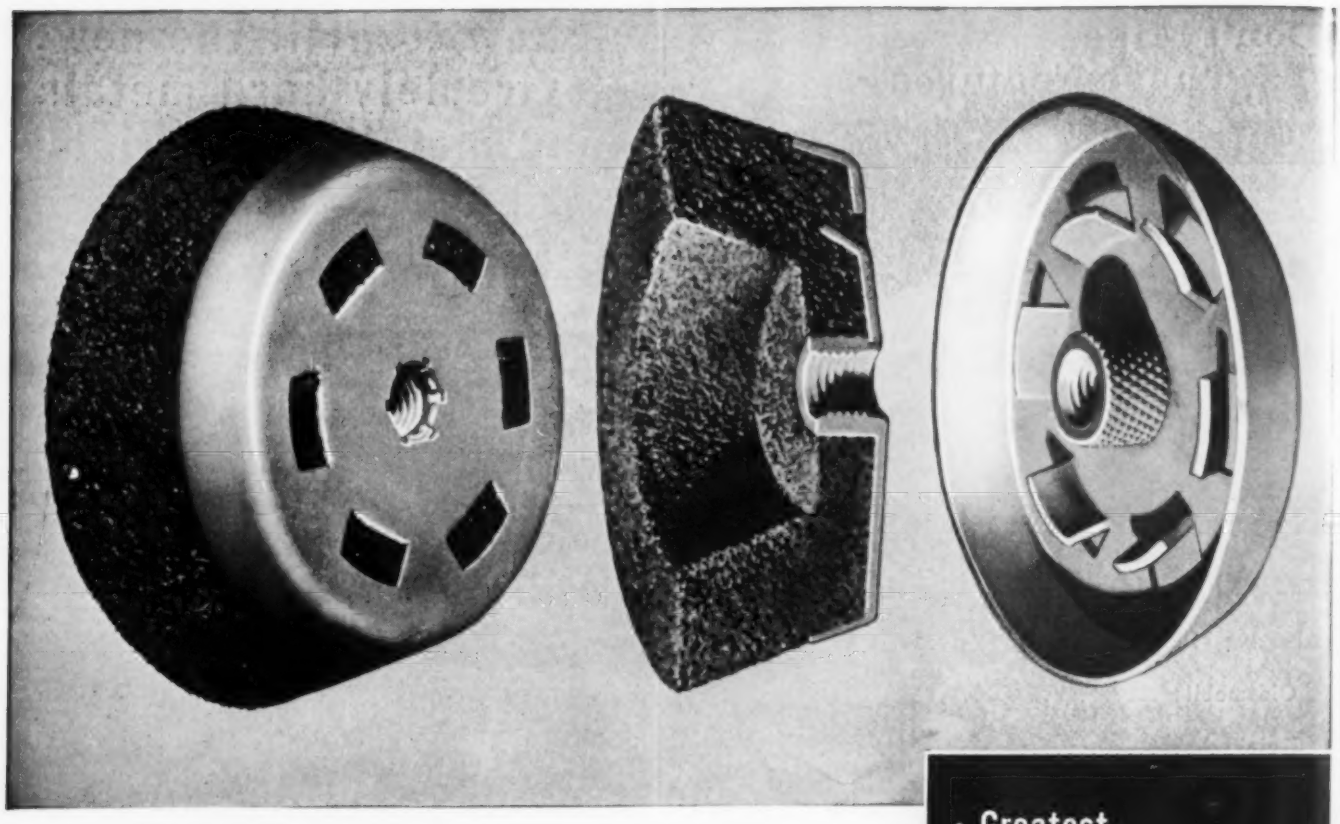

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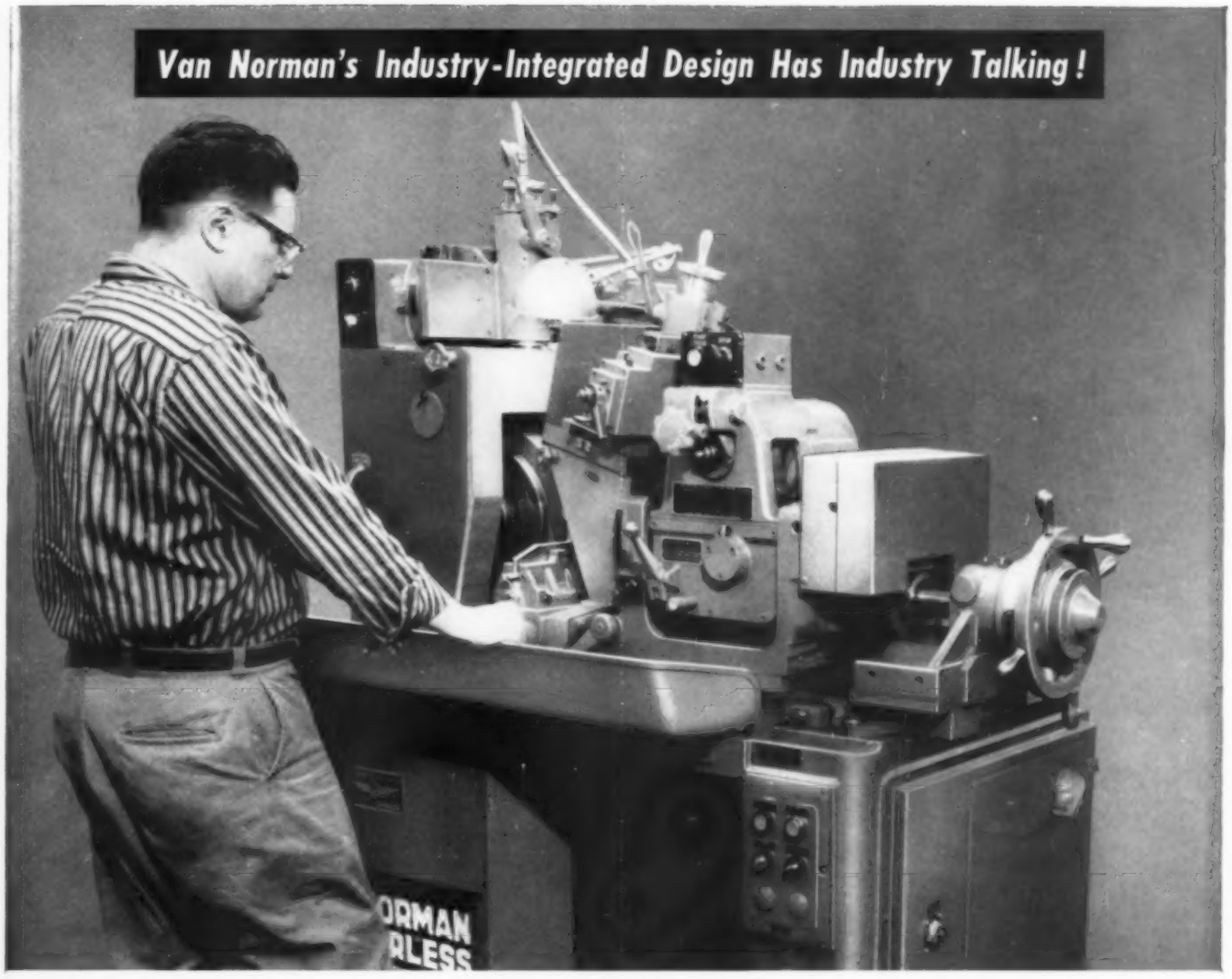

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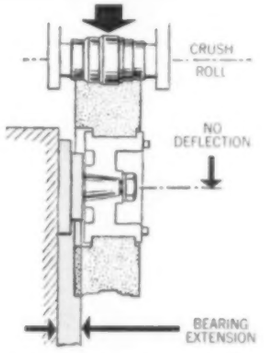

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